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ORIGINAL ARTICLES.

A HISTORY OF THE THEORY OF EDEMA.

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The history of the theory of edema shows a striking similarity to the development of the theory concerning secretion and absorption. The latter theory, however, has gained a firmer basis at an earlier time, and the research pertaining to secretion and absorption has shown the way to that concerning edema. The two theories traveled almost identic paths until, through the work of Ludwig and Haidenhain, the theory of secretion and absorption reached pretty firm ground, leaving the solution of the question regarding the production of edema in the rear. Much less good work has been done on the theory of edema during the time following the publication of Cohnheim's first investigation in 1877. Indeed, the theory of edema has been a neglected problem, if we may judge by the few papers which have been published on this subject during the last six years. Still, within the last months, the theory has taken an important forward step through the work of Professor Loeb of the University of Chicago. At last, a firm physical and chemic basis has been given to the theory.

In secretion and absorption as well as in edema, solutions of organic and inorganic substances pass through animal membrane. To determine the driving force, has been, and is today, one of the greatest problems of physiology. Secretion and absorption took a decided step toward their solution when philosophic explanations—a speculative basis—were cast aside and rigid physical and chemic investigations were instituted which promised better results. Capillary pressure and filtration seemed then sufficient to explain the phenomena. A new area appeared after the investigations of C. Ludwig. His researches on the secretion of saliva put the driving-force not outside of the cell membrane, but inside of it, and showed that those complex units of the body, the cells, are not passively but actively engaged in the secretion of saliva. Of equal importance is Haidenhain's work on absorption and on the flow of lymph. Even lymph flow, seemingly the most simple case of the passing of fluid through animal membrane, can not be explained upon the basis of filtration and diffusion alone.

Much time could have been saved to the theory of secretion, if comparative physiology had been taken into consideration. Even in animals, insects, for instance, where blood-pressure is at a minimum, secretion is well marked. If physiology had not ignored the facts of comparative physiology, filtration and diffusion could not have been considered as explanations of secretion or allied processes.

Finally, we are forced to acknowledge "vitalismus," or the "vital force" of the cell. We may call it that, provided we bear in mind that this term has lost all of its metaphysic meaning, and that by it we mean only peculiar chemic and physical properties of the cell. Of course, we must acknowledge that the chemistry and the anatomy of the cell are only in their infancy today. Let us call to mind here the illustration of the steamship, with which Haidenhain opens his classic paper on intestinal absorption. As soon as we will have passed the difficulties which Haidenhain enumerates, we will be enabled to look more clearly into this matter, and a complete solution of the problems of secretion, absorption, and allied processes will be the consequence.

In 1827, Richard Bright showed beyond doubt that the presence of albumin in the urine pointed to a diseased kidney. According to him, edema finds its origin in blood poor in albumin. The "thinned" blood reaches the tissues by filtration, while the normal blood is too thick to pass through the vessel wall. Although this theory retained its place for the next fifty years, modifications of it were put forth as a consequence of observations. Albuminuria, for instance, exists without kidney lesions. Albuminuria, as found in scarlet fever and diphtheria, shows another fact. Although, in these diseases, the urine often contains a large amount of albumin, edema at the same time being very extensive, nevertheless, the urine is discharged in such small quantities that the extent of the edema and the discharge of albumin are not at all proportional. Again, in some lesions of the kidney, the discharge of albumin may go on for years, the quantity of urine be large, and yet edema may never complicate matters at all, or at least not until the final stage of the disease has been reached.

These facts modified the original explanation of Bright, so that the loss of albumin was not supposed to be the cause of edema, but only a favorable factor for an easy transudation of the fluid constituent of the blood. The principal cause of edema was supposed to lie in the retention of water in the blood, which even led to a thinned condition of the serum, and increased the amount of other fluids of the body.[1] Filtration, therefore, played the principal part in the transudation process.

It is undoubtedly true that the amount of urine is increased, if large amounts of fluids are taken into the body. It is also known that during edema, the urine is diminished, while again, during the absorption of the edematous fluid, the urine increases in quantity. This phenomenon takes place during inflammatory processes also. Might it not be true that the urine-quantity depends upon the transfusion of fluids, and not vice versa? These are two entirely different conditions.

All the complicating facts and suggestions originating from Bright's theory about the dependence of edema upon the quantity of albumin in the blood,

[1] Bartels: Ziemssen's Handbuch d. spec. Path. und Therapie, x. 1.

finally led Cohnheim and Lichtheim[2] to institute an investigation which should settle this controversy. Until the appearance of their research, the filtration theory had held undisputed sway. Although this theory was not disproved by their work, still, many facts showed that other factors besides filtration are involved in the production of edema. Their results have been the starting point for the modern theory of edema.

It is true that Magendie tried to disprove Bright's theory some time before these authors, by injection of distilled water into the circulation of dogs. By this means, however, the red corpuscles were destroyed, and Magendie's results were not at all conclusive.

Cohnheim and Lichtheim on the other hand, used 6 per cent. NaCl solutions in their experiments, by this means doing no injury to the solids of the blood. Dogs were used most frequently, and the injections were made into the jugular vein. Often enormous quantities of the solution were injected; in one instance, 64 per cent. of the dog's weight without fatal results. When the dog's abdomen was opened previously, 92 per cent. of the dog's weight could be injected before death took place.

A lasting increase of pressure in the arteries did not occur, a temporary rise of pressure, however, was unmistakable. This rise occurred immediately after injection and lasted for a time, possibly until the superfluous fluid had found a space by means of the elasticity of the vessel wall. Venous pressure remained close to zero throughout the experiments. The great power of the circulatory system to accommodate itself to a change in the amount of fluids present played surely an important part in these experiments. The pulse waves were increased in strength, and continued thus for some time after the injection. Undoubtedly, much depended upon the already injected fluid. All these phenomena were less marked at the beginning, and became more pronounced as more fluid was injected into the body. When the pressure rose, pulsation of the veins took place. These waves traveled from the heart to the periphery. The blood became lighter in color and thinned to a higher degree than that of a person afflicted with any disease of the kidney. Both blood and lymph flow were increased. A large amount of light-colored urine was discharged and often slight albuminuria was present.

In all the experiments, however, the injections were never followed by anasarca. Even after the injection of enormous quantities of the NaCl solution, the skin and underlying tissues were perfectly dry; however, dropsical effusions in certain parts of the body did occur. Ascites was produced in most of the dogs; also edema of the submucosa of the stomach and intestines. The pancreas showed a high degree of edema; the liver and kidney also. The organs and cavities of the thorax, on the contrary, were normal. Only in some cases, and toward the end of the experiment did edema of the lung occur. The glands in nearly all parts of the body were edematous.

The edema produced in these experiments has a peculiar distribution. In general, the organs which become edematous during kidney disease, showed no such indications during or after the injections of NaCl solutions. The reverse is also true. As far as an explanation of this phenomenon could be given Cohnheim has done so. All the facts point to peculiar conditions which result from the injections. There is, therefore, no connection between the edema following or accompanying kidney disease and the one produced by the injections. The latter has an origin peculiar to itself, while for the former new causes must be sought.

These authors, however, put to rest the old idea of Bright and others. The results of their experiments disprove the idea that the production of edema depended upon the amount of albumin in the blood. The claims that the lining cells of the vessels could not hold the "thin" blood, but allowed it to filter through the vessel wall into tissues and tissue spaces could no longer be considered. The filtration theory received a hard blow by these investigators.

The authors concluded, moreover, that an alteration of the vessel walls was necessary to allow the transfusion of fluid to take place. They were able to produce anasarca in certain parts of a dog by subjecting the part to irritants before the NaCl solution was injected. Whether these changes were thought to be chemic or physical is not definitely stated, but the latter is more likely to be true.

Gaertner[3] repeated the experiments of Cohnheim and Lichtheim, frequently getting opposite results, namely, considerable and extensive edema of the skin and underlying tissue. He attributes the results of Cohnheim's and Lichtheim's investigations to a too rapid injection of the NaCl solution. With Bartels, Stewart and Grainger, he holds that the principal cause of edema lies in the excessive amount of water in the system.

Fleischer[4] suggested that the normal kidneys removed the superfluous fluid from the circulation. He repeated Cohnheim's experiment of injecting a solution of NaCl after having litigated the ureters. No increased blood pressure nor edema of the skin resulted; however, dropsical effusions into the tissues and cavities of the body as enumerated by Cohnheim took place.

X. Francotte's[5] results again went against the results of Cohnheim, namely, in his investigations on eleven dogs and two rabbits, edema of the skin followed the NaCl injections.

The research of O. Lassar, made under the direction of Cohnheim, and published in 1877, concerns itself with inflammatory edema. The author endeavors to show whether during inflammation, an obstruction to the absorption of inflammatory material occurs, aiding thereby the production of edema, or whether a rapid lymph flow really frees the tissues of an accumulation of edematous fluid.

For his experiments he used the posterior extremities of dogs, in which an inflammatory process had been produced. For this latter purpose, applications of hot water or croton oil were made. Often injections of .5 to 1 c.c. of turpentin were used to bring about the same result. As a rule the leg was constricted, and placed in hot water. As soon as an inflammation set in the constrictor was removed.

In all instances, Lassar found that the amount of lymph, coming from a lymph-vessel of the inflamed extremity, was greatly increased. From a normal lymph-vessel of a dog's leg, hardly one drop in ten minutes escapes. From the inflamed extremity, on the other hand, the lymph dropped spontaneously and 20-40 c.c. of it could be obtained in a short time.

[2] Virchow's Archiv., 77.

[3] Wien. med. Presse, Nos. 20-21.

[4] Sitzungsb, der physik. med, Ges. von Erlangen. No. 1, Juli.

[5] Bull: Belge, 4 Ser. T. 11.

The greater the edema, the greater was the lymph flow. We might conclude, therefore, that the large mass of exudated fluid in the tissue produced, by mere pressure, the rise in lymph flow. Normally, the weight of the tissues, aided by muscular movements, pushes the tissue plasma into the lymph stream. According to this explanation, the rise in lymph flow would take place later in the process, after a sufficient exudation has occurred to exert pressure. Lassar, however, found that the lymph flow is increased from the beginning of the process when there is no sign of an exudation. An increase in the transudation must occur from the time the inflammation begins, and the lymph flow rises long before an accumulation of fluid could take place.

Emminghaus [6] has shown that the same is true in obstruction edema. Thus he constricted the leg of a dog sufficiently to obstruct the venous circulation and the flow of lymph from the leg was greatly increased. After relieving the constriction, physiologic conditions set in again. There is, therefore a striking similarity between edema produced by inflammation and obstruction. In both instances, there is a disturbance of the circulation, accompanied by edema and increased lymph flow. By a number of analyses, Emminghaus showed that there is a great difference in the characteristics and chemic composition of the fluids drawn from a leg which is inflamed and one in which stasis has taken place.[7]

This author also raised objections against Arnold's [8] idea that in diapedesis the blood corpuscles escaped through preformed stomata. A different explanation must be looked for as a consequence of the fact that the fluids of inflammation and obstruction edema differ so much in composition. If stomata did exist in the vessel walls, the difference in the composition of the two fluids is to be explained; moreover, the absence of a transudate even after an increase of capillary pressure. All the facts, therefore, point to changes which determine the permeability of the vessel wall.

In 1878, Professor Welch [9] of Johns Hopkins University, published the result of his investigations regarding edema of the lungs, made under the direction of Cohnheim in Breslau. After reviewing the prevailing causes of this type of edema, such as atrophy and hypertrophy of the heart, local inflammations, hyperemia, etc., he came to the conclusion that none of the causes serve as a sufficient explanation. Welch produced edema of the lungs experimentally in dogs and rabbits. He brought about this condition in rabbits after ligating the arch of the aorta, between truncus anonymus and left subclavian artery; all branches except one of the former had to be ligated also. In dogs, edema of the lung occurred after ligature of the aorta between heart and truncus anonymus. When he wished to produce edema of the lung by venous obstruction, it was necessary to ligate all veins of the left lung and those of the upper lobe of the right lung. Only after resorting to such measures was he able to produce edema of the lung in these animals. In man, such heroic measures would, of course, be out of the question. The author concluded, therefore, that an explanation of edema of the lung upon the base of active and passive hyperemia was entirely insufficient.

In other experiments, Welch was successful in producing edema of the lung by digital compression of the left ventricle, hindering its action thereby. If the right ventricle acts normally while its fellow does not, one of the principal conditions for the production of this type of edema may have been produced.

Mayer [10] made similar experiments. He produced edema of the lung in rabbits after ligating the large arteries of the neck. According to him, this type of edema is produced by an obstruction to the return of the blood from the lungs, and by the driving of blood into the organ by accessory forces, such as: 1, increased tonus of the vessel wall; 2, increased pumping force of the thorax; 3, spasms of muscles, principally of abdominal muscles and diaphragm.

Colin [11] concluded from experiments which he performed in 1883, that moderately complete venous obstruction was sufficient to produce edema, and that vasomotor nerves took an unimportant part in its production. Ranvier, on the other hand, said that vasomotor paralysis was a necessary factor in conjunction with venous obstruction. In order to reach some conclusion, Sotnischewsky [12] examined the question again. Edema was produced in the extremities of dogs and rabbits by simple constriction, no matter whether the nerves were divided or not. The constriction, or ligature, of course, had to be made in such a way that the afflux of blood was not disturbed. Venous return alone, had to be interrupted entirely, otherwise, collateral branches would carry on the circulation. Like Ranvier, this author found that even after obstructing one vein, edema resulted, provided the nerve supplying the vein had been previously cut. He explains this fact upon the ground that the vasomotor nerves are paralyzed, the amount of blood in the involved region is increased and the collateral branches are no more able to transfer the blood.

In 1883 Jankonski [13] took up the same question under the direction of Cohnheim. First he determined the question of how far nerve section and vasomotor paralysis influenced inflammation. In a normal dog, the lymph flow from the posterior extremity remained the same after the sciatic nerve of the involved limb had been divided. When, however, both extremities were inflamed, by the methods previously mentioned, and the sciatic nerve of one limb was divided, the lymph flow from the paralyzed extremity was increased. Upon the physical and chemic properties of the lymph, nerve section had no effect.

After this determination, the author added venous obstruction to the inflammation. This was produced either by constriction of an inflamed posterior extremity or by injections of plaster of Paris into the veins leaving the leg. The result was, that by the combination of the two conditions, the lymph flow from the leg was greatly increased, and the amount of lymph was larger in this case than if inflammation or obstruction had been used alone. If the sciatic nerve was divided in such an instance, the amount of lymph discharged from the leg became still larger.

NaCl injections were made in a number of instances to determine what effect upon the lymph flow would then be produced by nerve section. About one-half the mass of the blood of a dog was substituted by a solution of NaCl. (The amount of blood was figured at

[6] Arbeiten des phys. inst. zu Leipsig, viii Jahrgang.
[7] See Hoppe-Seyler, Physiologic Chemistry.
[8] Virchow's Archiv., 58 and 62.
[9] Virchow's Archiv. 72, xx.
[10] Sitzungsberichte der Akad. der Wissenschaften zu Wien. lxxviii. Abth iii.
[11] Bull. de l'Acad. de Med., No. 51.
[12] Virchow's Archiv., 77.
[13] Virchow's Archiv. Bd., 93, p. 259.

one-thirteenth of the body weight.) Three days later section of the sciatic nerve was made and the lymph flow observed. Simple obstruction to the lymph flow had no effect, but, after division of the sciatic nerve, a considerable increase in the amount of lymph followed. This result shows that a change in vasomotor action is a sufficient cause for the production of edema in an animal with "thinned" blood. This fact, seemingly, is of great importance in explaining the edema of cachectic individuals. The afflux to the paralyzed leg produced by enlargement of the blood-vessels, is not so considerable after nerve section as during inflammation; still, in the former case, the edema is more extensive. From this fact, the assumption follows that by the loss of nerve innervation, the walls of the blood-vessels are changed in an unknown way, and allow the fluids to escape.

A. Landerer's[14] investigations about the influence of the pressure of the tissue spaces upon lymph and blood flow have an important bearing upon the theory of edema. In order to see to what extent tissues possessed elasticity, the author used Braun's method upon different tissues, and found that they possessed this quality in a high degree. The tissues surrounding the capillaries, therefore, are of the same importance as are the media for the arteries. They serve as a reservoir to the capillaries. Edematous tissues on the other hand, have little elasticity, but possess expansibility in a marked degree. Of course the formation of edema may be due to a second cause, namely, continued expansion of the tissues as occurs during obstructions to the circulation.

In inflammation, the elasticity and firmness of the tissues and vessel walls is impaired. According to this author, alterations in the elasticity of the tissues is the primary factor in the change of the circulation of the blood and lymph. The phenomena of inflammation, therefore, follow the loss of elasticity of the tissues and not vice versa. By weight lifting, he demonstrated that inflamed tissues possessed marked expansibility, and little elasticity. To this loss of elasticity is added a greater pressure of the fluids within the tissue. This rise in pressure of inflamed tissues has been previously demonstrated by Quincke. The circulation is quickened by the loss of elasticity of the tissues, and Landerer hopes to have found in this a simple physical explanation for hyperemia. The dilatation of the capillaries is also a consequence of the loss of elasticity, and a condition favoring stasis. In general, Landerer considers inflammation and resulting edema as an impairment of the elastic equilibrium of the circulating fluids of the body. Wound healing and traumatic inflammation the author explains in the same way.

G. Salvioli[15] performed experiments in a similar manner as Cohnheim. His work, published in 1885, has given the following results:

Under constant pressure, NaCl solutions were injected which did not exceed 10 per cent. of the body weight of the animal. Hardly any effect was noticed, the superfluous fluid being removed by the kidneys. When solutions of a strength of 30-40 per cent. of the body weight were injected, different results were produced. Already during the experiment, all secretions of the body were increased. The amount of urine and saliva was large, tearing resulted, and the stomach often contained a large amount of water. These symptoms were followed by swelling of the abdomen, impaired circulation and respiration, and finally death. Postmortem examination showed an edematous condition of the intestinal walls, stomach, pancreas, liver, spleen and kidneys. The pleural cavities and the pericardium were free from fluid; moreover, edema of the lung did not always follow the injections. The skin, with the exception of the region around the eyes, the neck, and inguinal regions was perfectly dry. Practically the same results as those arrived at by Cohnheim and Lichtheim followed Salvioli's experiments.

Small quantities of injected fluid are of course easily removed by the kidneys. When larger amounts are injected, other organs must contribute to the removal of the superfluous fluid. Probably the intestinal canal serves as an eliminator of some of the fluid, if too much intravascular pressure follows the injection. The action may be similar to that produced in morphin poisoning. In general, however, the organs of the body vary greatly in their reaction to the increased mass of fluid, the variations being due to their difference in structure.

In order to determine how much depended upon the quality of the NaCl solution and upon the intravascular pressure in the production of edema, Salvioli made the following experiment: The author produced artificial circulation in the intestines and posterior extremities of different animals, using NaCl solutions with 40 per cent. resp. 10 per cent. of blood, under a pressure of 76-120 mm. mercury. While edema of the intestines was produced almost immediately, after injecting the second solution under low pressure, it took one to two hours and higher pressure for the appearance of the edema, when the first mixture was used. Edema of the extremities occurred much later, and only after increasing the pressure still more and obstructing venous return. By irritants, heat for instance, the edema was made more extensive.

Salvioli suggests no other force than filtration as an explanation for edema, however, one fact which the author puts forth should not be overlooked. He cautions investigators against applying the facts found by experiments upon animals, to man, without using some reserve in doing so. That the skin and underlying tissues in man become so easily involved in edema is undoubtedly due to their structural peculiarities. While the skin of man is such an important excretory organ, the same is not true in dogs. Cohnheim has already shown that horses died quickly of edema of the lungs, accompanied by hypersecretion of sweat, if NaCl injections were made. We see, therefore, that different animals are affected in different ways by these experiments, and the problem of edema in man will require different investigation and explanation for its solution.

According to Salvioli, the transudation is dependent upon the nutrition of the animal, the concentration of the injected fluid, and the pressure. His belief in the filtration theory becomes much more pronounced when he puts down as the principal cause of edema the permeability of the vessel walls, and endeavors to explain the problem upon a mechanical basis.

Similar to Landerer, von Basch[16] finds the cause for edema of the lung in the rigidity of the walls of the alveoli which has been brought about by a hyper-

[14] Die Gewebspannung in ihrem Einflusse auf die Örtliche Blut und Lymphbewegung, Leipzig, 108 S.

[15] Edrema et edimi idremici. Arch. per le Scienze med., Vol. viii, No. 21.

[16] Wiener med. Blaetter, No. 15.

emia of this organ. The elasticity of the tissue is lost, giving rise to edema. The appearance of edema of the lung in muscarin poisoning, M. Grossman[17] attributes to blood stasis, produced by spasms of the heart muscle. The spasms are stronger in the left than in the right half of the organ, increasing venous pressure in the right auricle, in the pulmonary artery and the left auricle.

That edema of the lung is due to an obstruction is denied by H. Sahli.[18] Neither the experiments of Welch nor those of Grossman are sufficient proof to him for such an assumption. From pathologic, anatomic and clinical facts, he assumes that edema of the lung has a local cause which lies in an alteration of the capillary walls. What this change is, whether physical or chemic, he does not state. According to him, impaired action of the left auricle (Welch) and spasm of the heart muscle (Grossman) can never cause a rise of blood pressure in the circulation of the lungs, necessary for the production of edema. This is undoubtedly well proven by later experiments.

The anasarca of the lower extremities occurring during ascites and cirrhosis of the liver is undoubtedly an obstruction edema, produced by pressure upon the inferior vena cava. In order to see what influence the pressure of the ascitic fluid has upon anasarca of the lower extremities, G. B. Queirolo[19] measured the lower limbs before and during withdrawal of the dropsical fluid from the abdominal cavity. With the removal of the fluid the size of the limbs decreased. This certainly shows that in this and all similar pathologic conditions of this locality, an obstruction edema is formed by impairing venous return and the lymph flow from the leg. Undoubtedly, anasarca of the lower limbs does not always accompany ascites; this fact compelling us to believe that other factors must play an important rôle. It may, moreover, be true that the pressure exerted by ascitis or any other similar condition is not at all great enough to produce anasarca of the limbs, and that its primary cause lies in an impaired action of the heart. In the light of modern research, however, both conditions can be looked upon as exciting causes only, mere secondary causes as far as their importance is concerned. Obstruction, inflammation and similar conditions only pave the way for the real phenomena of edema.

As late as 1893, W. Dickenson[20] investigated the question whether filtration or diffusion played the principal rôle in edema. From a comparative chemic analysis of the blood and dropsical fluids, he concludes that diffusion is the principal factor in the interchange of salts, while blood pressure determines the escape of the albuminous constituents of the blood. The explanation of the fact that frequently we do not have edema during acute nephritis or renal calculi, this author finds in an impaired action of the heart, and in low blood pressure. When edema does occur the pressure is always high. In chronic nephritis, with or without edema, the blood pressure increases on account of hypertrophy of the heart and arteriosclerosis, accompanied very frequently by complications in the lung which lead to blood stasis. The occasional absence of edema in this disease, Dickenson attributes to an increased discharge of urine.

[17] Zeitschrift für klin Med., Bd. xii, S. 550.
[18] Zeitschrift für klinische Medicin, Bd, xiii, 5.
[19] Revista Clinica, No, 1.
[20] Medico-Chirurgical Transactions, vol. lvii, 317.

Finally, even diffusion seems not to be a sufficient explanation of edema. During edema, due to acute nephritis, the blood pressure is increased. When the disease becomes chronic the pressure rises even more, cardio-arterial changes set in and the edema decreases. As soon as the heart's action becomes insufficient, the edema increases again.

No history of edema would be complete without mentioning the work of H. Senator.[21] In 1868 he joined those investigators who hoped to arrive at a solution of the problem of edema by making the chemic composition of dropsical fluids the basis for further research. Although the knowledge of the composition and peculiarities of edematous effusions is not to be underestimated, it has never caused any advance of the theory of edema. On the contrary, it has served to prolong the life of the filtration theory, as a natural consequence of the results of the chemic analysis, which point rather toward filtration.

In order to show the influence of a different venous pressure upon the flow and composition of lymph, constriction of the lower extremities of dogs was resorted to, and after twenty minutes the fluid escaping from a trocar was examined. The amount of lymph was increased after constriction. In ten out of fifty cases the amount of albumin was the same as that of the blood; in thirteen cases it was increased and in seven instances decreased. Only in five of the thirteen cases, the increase in the amount of albumin was undoubtedly due to venous obstruction. The quantity of NaCl remained the same in five instances out of ten; seven times an increase and six times a decrease was noticed. An unquestionable result the method does not give, as even before constriction of the extremity a certain amount of transudation has taken place.

Senator considers the theory of Bright and Bartels to be wholly inadequate for explaining edema following nephritis. He upholds the theory of Cohnheim according to which the blood and lymph vessels not only in the skin, but also in the serous membranes, have undergone an abnormal change and have become more permeable. In edema following or accompanying scarlet fever, malaria, etc., the glomeruli of the kidneys seem to be greatly affected. It is certain, however, that as the poisonous substances continue to irritate the body, the blood and lymph vessels of other localities besides the kidney, become affected. According to this, Senator attributes the absence of edema in contraction of the kidney to a slow and small injurious influence of the disease-substances.

After having investigated the absorption of ascitic fluid, H. Hamburger[22] comes to the conclusion that the blood-vessels play the principal rôle in this process. The lymph vessels are involved in a lesser degree. The diaphragm serves as a pump by means of which the exudated fluid is forced into its lymph spaces and finally into the ductus thoracicus. The lymph vessels in the other part of the peritoneum, however, aid in the absorption. According to this author, osmosis can have no part in the process, also Haidenhain's theory can not be considered, as absorption takes place after extensive injury to the peritoneum and even after death. About the production of edema, Hamburger holds about the same view as Cohnheim. This is to be seen from his enumeration of the causes of obstruction-edema, which is as follows:

[21] Spec. Pathologie und Therapie (Nothnagel), xix. i, 1.
[22] Nederl. Tigdschr., 24 Aug. and 7 Sept., Virchow's Archiv, Bd. 141, ii.

1. Considerable venous hyperemia.
2. Increased permeability of the vessel walls (Cohnheim).
3. Disease substances which irritate the endothelium and exercise a peculiar influence upon the lymph flow.
4. Retarded absorption.

Lazarus-Barlow,[23] in his paper on the pathology of edema, tells us that the mechanical causes of edema are not at all satisfactory, but serve only as primary or exciting causes for the real phenomena of odema.

Only recently the theory of edema has taken an important forward step through the work of Dr. Loeb[24] of the University of Chicago. A physical and chemic basis has been given to the theory, and if its final solution has not been reached, at least the solution of the question must be close at hand. Just as the development of the theory of secretion and absorption is awaiting a thorough knowledge of the properties and functions of the cell, so will it be necessary for the theory of edema to await such an end before the final solution of the question will be possible.

According to Dr. Loeb, the transudation of the fluid into the tissues is greater than that of the blood and lymph. Such causes, therefore, must be at the bottom of edema as either increase the osmotic pressure of the tissues, or decrease it in the circulatory system.

First, the author demonstrates the possibility of a rapid change in the osmotic pressure of tissues; showing thereby that the forces which according to the filtration theory are able to produce edema are wholly inadequate. The pressure of a 0.7 per cent. NaCl solution, which is isosmotic to the blood and the resting gastrocnemius of a frog, amounts to 4.9 atmospheres. It is twenty times greater, therefore, than the blood pressure ordinarily present in physiologic investigations. Only a trace of acid or alkali in muscle increases the osmotic pressure to such an extent that the muscle becomes edematous in an 0.7 NaCl solution. By stimulation, the osmotic pressure is raised, and water is taken up by the muscle. After tetanizing the gastrocnemius of a frog for ten minutes, the increase in its osmotic pressure amounts to 1 atmosphere. After a few hours, the muscle in a 4.9 per cent. NaCl solution begins to take up water, the reaction becoming acid. The osmotic pressure of such a salt solution is over 30 atmospheres. The author concludes that through the influence of the original loss of water, chemic changes must take place in the muscle which raise its osmotic pressure by about 25 atmospheres.

When we compare these pressures with some produced by an increase of blood pressure, the absurdity of supposing that the latter are sufficient to produce edema is striking. During the experiments on the production of edema of the lung, Welch never got a greater rise in blood pressure than 1/10 atmosphere, in the lesser circulation. A rise in osmotic pressure of 1 atmosphere, however, occurs during common muscular exercise and an increase of 25 atmospheres can be produced quickly by chemic means. That is a rise 300 times greater than can take place during a change of blood pressure. The filtration theory, therefore, can not be considered, and osmotic pressure must be the principal factor in the production of the edema.

The cause for the presence of blood corpuscles and epithelial cells in edematous fluids, the author finds in the morphologically changed blood-vessels. This change is brought about by the same chemic substances (poisons) which produce the increase in osmotic pressure. For the purpose of showing that these poisonous substances may be produced by a lack of oxygen, Dr. Loeb gives several instances of similar processes. An ameba which suffers a lack of oxygen becomes contracted. Quincke thinks this is due to a disintegration of the more solid constituents of the ameba. If oxygen is taken from the developing eggs of *Ctenolabrus*, the walls of the splitting cells disintegrate. As soon as oxygen is admitted again, the cell walls become normal. The bodies of certain infusoria become fluid in an atmosphere poor in oxygen.

In order to disprove the supposition of the filtration theory, that during edema the fluid constituents of the blood are pressed into the tissues, Dr. Loeb made the following experiment. He used a number of frogs, in which the circulation of one posterior extremity had been completely stopped by a ligature. The gastrocnemii of both legs were then removed and weighed. Although the two muscles are equally heavy under ordinary circumstances, yet in all instances the gastromemius removed from the ligatured leg was heavier. Its weight increased with the time that had elapsed since the ligature was applied. After 16 hours, the weight of the muscle of the abnormal leg was about 1 to 3 per cent. greater than that of its fellow on the opposite leg; after twenty-four hours, the difference amounted to 15 per cent., and after seven days to from 25 to 40 per cent.

In order that there might be no possibility of an increase of blood pressure in spite of the ligature, and a consequent occurrence of edema, some gastrocnemii were removed and immersed in a physiologic NaCl solution. By this means, all possible circulation of blood was stopped, and a lack of oxygen was produced at the same time. These muscles behaved in the same way as those in the ligated leg of the frog; showing conclusively that the blood pressure has very little to do with edema.

It has been shown by Araki that sugar and lactic acid are excreted in the urine if certain amounts of oxygen are withheld from an animal. The increase of weight in a muscle in the experiments enumerated is accompanied by the formation of one or several acids. The nature of the acid (or acids) has not as yet been settled, but Dr. Loeb is inclined to think that lactic acid is one of the possibly several acids formed in the oxygen-starved gastrocnemii.

The favorable influence of nerve section upon the formation of edema, this author considers as not proven. Moreover, if this statement were true, this fact could not be utilized as an argument for the filtration theory. We know that nerves exercise direct chemic influences in secretory processes, and as the nature of the nerve innervations is yet indefinite, we may justly suppose that many, if not all, nerve-transmissions are of chemic origin. Gaule thinks that the nerve gives off a special substance, but Dr. Loeb suggests a dissociation of ions, if electric phenomena play a rôle in the transmission of impulses.

Professor Welch attributes edema of the lung to an increased blood pressure, but this driving force is entirely too small in comparison with osmotic pressure. Upon one fact, Professor Loeb dwells particularly. While in rabbits, the ligation of the principal branches of the arch of the aorta produces edema, this condi-

[23] British Med. Journal, March 23-30.
[24] Archiv für die ges. Physiologie, Bd. 70, 457.

tion does not occur in dogs under similar circumstances. Walther has shown that rabbits and dogs differ greatly in their reaction toward acids. While in rabbits, a sufficient quantity of acid proves fatal, dogs are almost immune against it. The difference in their reaction toward acids is caused by the greater amount of ammonia which is produced through the influence of the acids in dogs. It is not necessary to seek the cause for edema in the formation of acids directly, but it must be acknowledged that certain chemic peculiarities exist in these animals which determine the difference in the formation of edema of the lung.

Sigmund Mayer and von Sahli demonstrated that curare lessens the liability of the formation of edema of the lung, while muscular spasms favored its production. Their explanation has obstruction, increased blood pressure, and filtration for its basis; however, Professor Loeb gives a more interesting cause for this difference. The muscles are the principal seat of the oxidation processes and, therefore, in these structures the acids must be formed which are produced by a lack of oxygen. When curare is given, the metabolic processes of the muscles are reduced, and less poisonous matter circulates through the heart and lungs. Muscular spasms, on the other hand, cause an increase of these injurious substances and are, therefore, more liable to produce edema.

According to Professor Loeb, the cause of edema lies in the chemic changes which occur in the tissues, and which are mostly due to a lack of oxygen. These changes lead to an increase of osmotic pressure, which is greater in the tissues than in the blood and lymph. Morphologic alterations of the vessels are also a consequence of the chemic exciting cause. Such conditions as blood stasis, inflammation, etc., are only the primary causes which give rise to chemic changes and consequently edema.

For fifty years after Bright and Bartels, the filtration theory has held undisputed sway. Nobody seems to have considered any other force than mere filtration as an explanation for the minute phenomena of edema. Through the work of Cohnheim and his pupils, however, a future was given to the theory. Bright's theory was disproved and new factors were found which promised to be worthy of careful research. The frequent suggestion that an alteration of the vessel walls and blood pressure are the means by which the fluid escapes from the vessels, is only a part of the filtration theory. It is hardly possible that any other change than a mechanical one was thought of when an alteration of the vessel walls was mentioned. The work of Cohnheim, Welch and others has really been done in the interest of the filtration theory, the chemic side of the formation of edema having been neglected. Only recently the theory has found a physical and chemic basis through the work of Loeb. The theory of edema stands today where the theory of absorption stood before Haidenhain's classic paper was published. In spite of the many attacks upon Haidenhain's explanation, the merits of his work have not been lessened. In fact, the criticisms of the extreme physicists have only served to strengthen the belief that the cells play an important rôle and that osmotic pressure is not the only factor to be considered in absorption. Just as important is the physiologic state of the absorbing membrane. The same end has been reached in the theory of secretion through the work of Ludwig.

Why should edema be such a passive process? Undoubtedly it is true that not so much stress can be placed upon cell activity in edema as in secretion and absorption, naturally edema would be a more passive phenomenon. Just as secretion and absorption depend upon the physiologic condition of the cell, so does edema depend upon the pathologic state of the cell. Still it is best not to conjecture, but to await further developments of the theory of edema.

RETROMAXILLARY GROWTHS.

OPERATIVE TREATMENT, ESPECIALLY OF NASO-PHARYNGEAL FIBROMATA.

BY CARL BECK, M.D.

CHICAGO.

Among the tumors of the nasopharyngeal cavities which are amenable to operative treatment, the nasopharyngeal fibromata, or so-called nasopharyngeal polypi, are the most important. Sarcomata and carcinomata of this region may also be treated surgically, but when one considers how unfavorable the prognosis is, even in the case of a very good operative result, one must acknowledge that it is inexpedient to undertake so serious an operation for the sake of such a trifling benefit. Butler, who has paid particular attention to this question, finding an operative mortality of 30 per cent. and such a small number of cases free from recurrence after three years, arrived at the conclusion that the operation must be condemned unless there is a reasonable hope of obtaining better results in the future. In addition to the nasopharyngeal polypi and malignant growths, there are a number of very rare tumors which may be extirpated. The polypi, however, are clinically the most important. Histologically they are mostly fibromata or fibroangiomata which produce grave symptoms, even endangering the life, and their removal, as a rule, is followed by a complete cure. The question as to the best method of removing them has been discussed for a long time in the past, and even now there is a wide divergence of opinion on this point among surgeons.

The difficulties of the technic lie in the obstacles encountered in obtaining access to the growths. They arise in a region which can not be attacked through any natural opening, even with instruments of special construction, without making a considerable breach in the skeleton of the face. The development of the technic of the operation shows that surgeons are more and more endeavoring to replace the operation in the dark by an anatomic preparation under the guidance of the eye. Experience shows that pieces of the growth left behind after such operations of polypi cause not only recurrences, but degenerate and even become malignant (Koenig) and, therefore, the surgeon endeavors to remove the growth radically. On the other hand, others maintain positively that such relinquished pieces disappear spontaneously, that even the whole tumor of considerable size disappears after a certain age, say twenty-five years (Lafont-Gosselin), but it can not be discovered, a priori, what is going to be their course. Besides, there is another cause which was pre-eminently noticeable in one of my cases, calling for the most radical removal of these tumors. These fibromata are often multiple, and parts are liable to be overlooked, and these remaining small growths may develop to enormous size, as owing to the removal of part of the growth,

they obtain room to spread. Therefore, the axiom must be: Under the guidance of the eye remove everything anatomically by preparation. If we review the history of the technic we can see that it yields more and more to this postulate: First of all, the tumor must be exposed.

When I speak of tumors of this kind, I mean only those which, on account of their considerable size, cause obstructions of the nasopharyngeal space with dyspnea, dysphagia, etc. By no means do I refer to those small growths which produce only local symptoms, as obstruction of choanes, catarrh, etc. Such large fibromata with their protuberances toward the pharynx, larynx, antrum and orbit, cause destruction of the bone, dislocation of the eyeballs, may perforate the base of the skull, and give rise to meningitis. One of the most pronounced cases I ever saw is the specimen in the Musée Dupuytren, in Paris, the picture of which has found its way into most text-books.

To lay bare such tumors one must produce a considerable breach in the skeleton of the face. The objection to such an operation is found on the one hand in the disfigurement of the shape of the face, and on the other hand, the greatest objection is in the hemorrhage during the operation, and its consequences thereafter, by causing diseases of the lung (pneumonia), gangrene, etc. No wonder that formerly even prominent surgeons refrained from operative radical treatment, and that many still resort to palliative rather than radical methods, considering the operation too dangerous. If we start from this standpoint, we will consider that method best which in the highest degree fulfills the following requirements: 1, total exposure of tumor; 2, prevention of hemorrhage; 3, least possible disfigurement and best function of the parts operated upon after the surgical interference; 4, prevention of secondary diseases.

It is no easy matter to satisfy all these requirements, but we can approach very near to the ideal. The methods used are:

1. The ligature or treatment with the écraseur, the galvanocaustic scissors or loop. This least answers the requirements, as the écraseur very often breaks, and the hemorrhage becomes excessive, and that part of the tumor remaining behind the ligature sloughs off and septic inflammation takes place, the sloughed and septic parts are aspirated into the lungs, and septic pneumonia and gangrene follow. Such methods are being abandoned more and more by modern surgeons, and in the future will not be used, we hope. The same objections hold good against all mortifying methods.

2. Electrolysis, a method which gives remarkable results in the hands of skillful operators like Nélaton, Bruns, Koenig, Karsberg, and others, is not reliable in every case. It has, however, one advantage, that it can reduce the size of large growths, and removes the mechanic obstruction symptoms, but it may be safely said that in large-sized tumors it will not remove the entire growth. That requires an enormous amount of patience on the part of the surgeon and the person treated, and when the tumor diminishes in size, it will become less and less accessible to instruments, and for this reason we may say that it is impossible to remove the tumor radically. Moreover, tumors on the antrum and orbit can not be reached at all, and they may afterward grow and become malignant. Besides, the technic accomplishment of such a treatment is very arduous, and can not be applied except in hospital cases, and perhaps only in such cases where hospital operations allow tedious experiments of this kind. In this country a patient would never consent to having forty or fifty treatments, painful and uncertain in their ultimate results, if he knew that a radical operation would remove the growth surely and rapidly. Electrolysis certainly may be of great use where we have to deal with small tumors with irritative symptoms.

3. As to the operative treatment, in reviewing the many methods advised by different surgeons, we can say that each and every one has its advantages for special cases. For large growths, however, only a few can be of use. All operations aim to get access to the polypi and, naturally, those which get the best access with the least destruction are to be preferred. All breach and flap operations have one great danger, the hemorrhage, causing anemia, which becomes dangerous as such, or by aspiration into the lung. The latter danger is more to be feared. The hemorrhage may arise from the severed vessels of the face or the vessels of the tumor, and may be prevented by ligature of the main vessels furnishing the blood, like the carotid, or by diverting the blood outward. To prevent aspiration of the blood, we can let it run out from the hanging head, or we can perform a preliminary tracheotomy with tamponade of the upper air-passages. If we compare these two safety measures with each other, the ligature of the carotid artery seems to me preferable. It is not dangerous, but it may not be sufficient to prevent all hemorrhage. From my experience in a number of cases operated on for such purposes, I may say that it has always been sufficient. One can object, and say that if the hemorrhage comes from the tumor it comes from both sides, since the tumor receives its nourishment from both sides. In reality, however, one side is affected more than the other, and one can diagnose the affected side beforehand from the clinical symptoms, e. g., from the protruding of one eyeball, the destruction of the bone on one side, etc. To operate without such ligature of the main vessels, and to rely on the ligature of the single vessels as they are reached, means to operate in a pool of blood, and such operations are the most dangerous, tedious, and also the least clean. The preliminary ligature has therefore, many advantages. The tracheotomy is a very useful method, and Razumovski has shown in operating on several cases that it prevented the aspiration of blood, but it is unnecessary and under certain conditions may cause complications. Generally, we do not perform preliminary tracheotomy, because we succeed with ligature of the carotid and operation on the hanging head.

As to the formation of the breach necessary for exposure of the growth, it can be performed two ways: 1. From the mouth. Gussenbauer's method seems to me preferable to any other, because it gives the best access to the growth, and does not disfigure the face, but one still operates under difficulties, and an anatomic preparation is hardly possible. 2. From the face. The method of Ollier used by Razumovski, that is, the flapping open of the nose, does not produce large scars, but it gives insufficient access, and also the scar formation is not trifling. The nose often looks very flat, and as a notch or dent is produced in some cases, the result is very unsightly. To me the old Ferguson's or Liston's method seems the best. It fulfills all requirements. Of course I always ligate the caro-

tid artery beforehand, so that I operate with very little loss of blood. The operation consists in osteoplastic resection of the upper jaw. An incision is made, beginning at the middle ear, crossing the face in a line underneath the eye, passing alongside the nose around the wing of the nose to the middle of the upper lip, splitting this upper lip and the soft parts of the palate right through, chiseling the bone on the malar, nasofrontal and middle palatal lines, prying the bone at its junction, and thus the whole tumor is made accessible. It may now be removed with its processes and anatomically prepared, all the hemorrhage stopped, the different parts replaced and sutured—only the two incisors being wired—otherwise only the soft parts are united, but in the most exact manner. Particular attention must be paid to this adaptation, inasmuch as primary union insures a good function of the parts replaced, and causes the least disfigurement. As the accompanying figure of one of the cases shows, this disfigurement is very trifling, and as the scars run all along the natural folds, they are hardly noticeable (Fig. 1).

FIGURE 1.

In the same manner as these nasopharyngeal polypi, I have removed sarcomata and carcinomata of the retropharyngeal region, leaving the upper jaw, where it was not affected by disease. I must not neglect to mention one feature of this operation which caused me considerable trouble during the after-treatment. In the osteoplastic, as well as the permanent extirpation of the upper jaw, a considerable chemosis of the conjunctiva of the same side set in, and in many cases ulceration of the cornea developed. At first I could offer no explanation for this, as neither vasomotor nor any other nervous disturbance could be detected. In one of the last cases it appeared to me that the ulceration was due to pressure from the dressing. By loosening the coaptation of the lower lid and cheek, the lower lid loses its tension and droops, thus opening the slit of the eye, and leaving the cornea exposed to the friction from the dressing, which, however fine it may be, might cause ulceration of the cornea. I would, therefore, suture the eyelids temporarily, or paste them with collodium to prevent such a mishap.

Without going into details of all cases operated upon by this method, I will give briefly the history of one of the most interesting:

Case 1.—C. P., 10 years old, was brought to me by his mother, in a very critic condition, unable to walk in consequence of exhaustion. He had been sick for a long time, and as he sat in the chair, with wide open mouth, gasping for breath, the expression of his face showed hunger for air. This was due to some obstruction in the respiratory passage. The face was disfigured by protrusion of the right eyeball, and the entire right side of the face. The nose on that side did not show the usual nasolabial fold, but the bridge passed directly into the cheek. The right nostril was very much enlarged, and showed a bluish-white tumor mass protruding. The inspection of the mouth showed that the posterior portion of the pharynx was filled out by a tumor mass, depressing the soft palate and tongue and leaving only a very small space for the entrance of air and, naturally, also for food. The mother gave the following history: The child had experienced difficulty in breathing since she could remember, but it had become very annoying in the past two years. She had consulted several physicians, amongst them specialists, who advised operations and had tried to operate on the child. Dr. B., under whose care this child had been at the Clinic for Nose and Throat of the College of Physicians and Surgeons, gave me the following report: He had tried to remove the tumor through the nostril with an écraseur, but broke the same in application. The bleeding from the tumor was so profuse that the child was almost exsanguinated, and for two days in danger of death. He consequently gave up the operation. A well-known surgeon also advised against operation on account of the dangers attending the same, so the mother decided to let the matter rest.

The expression and appearance of the boy's face reminded me so very much of the classic specimen in Dupuytren Musée, Paris, of a retromaxillary fibroma, that the diagnosis was almost intantaneous. In my judgment, the tumor was about the size of a man's fist, and must have destroyed considerable of the bone and other tissues in order to have found space for growth. I told the mother that the operation would be dangerous, but was the only effective thing to do, and she consented, even taking the chance of having the child's face disfigured.

The boy was taken to the Post-Graduate Hospital, and the operation was there performed before the class. The first step taken was a ligation of the carotid artery, in a classic manner, preparatory to the operation. Then the child was brought into Rose's position (i. e., with head hanging over the table), and an incision made, beginning at the tragus of the ear underneath the eye toward the inner angle corresponding to the nasal fold, to the middle of the upper lip around the nose; this upper lip was split right through, also the gingiva in the center, and then the palate slit clear down to one side of the uvula. A chisel was then used to divide the malar bone, the upper maxillary at its junction to the frontal in a backward direction, and the maxillary bone through the palatal process chiseled through. This last time the chisel was used to pry open the maxillary bone, and with a few movements to and fro it was raised from its place, and thereby bent to the side like a lid. The operation thus far caused some bleeding, but not one ligation of an artery of any size was necessary. The bleeding was easily controlled by the application

of a few forceps. Now the tumor was entirely exposed, and it could be seen that it had filled out, not only the pharyngeal cavity, but also the antrum Highmori, and had with one lobule partly destroyed the inferior orbital plate, and with another partly destroyed the anterior wall of the maxillary. The tumor seemed to have its origin at the sphenoidal sinus, at least there was its closest attachment. With curved scissors it was separated all along its attachment. This separation again caused some, but not excessive, hemorrhage. Though the tumor seemed to belong to both sides of the base of the cranium, the right side seemed to furnish more circulation to the same, the hemorrhage being very light on account of the ligature of the carotid artery.

One peculiarity was noticed in the growth. Two entirely independent lobules of the same nature were found in the external portion of the antrum, making three tumors in all. In an operation not having such a wide opening, these two tumors would certainly have escaped notice, and would not have been removed. As it is known that such remaining tumors occasionally grow rapidly after operations, and even become malignant, an omission of this kind might have prevented the results of the operation. After the removal of the growth, the bleeding cavity was packed with gauze, the ends of the strips brought out through the undivided nostril, then the open skin flap of the upper jaw closely attached to its former place, and all the divided surfaces exactly sutured.

The shock of the operation was considerable, as was expected, but under careful observation the pulse remained in good condition, and the child rallied. There was no complication, and seven days afterward the child could be exhibited at a meeting of the Chicago Medical Society. One remarkable feature developed in this case, also in two others, which remained unexplained to me as well as to ophthalmologists whom I consulted. The child developed a central ulcer of the cornea, of the right eye, which resulted in an opacity necessitating iridectomy, performed by Dr. Gradle. The result of this operation, cosmetic, as well as curative, was perfect. Today, about two years after the operation, the child is perfectly well, has no perceptible disfigurement of the face, and the bones are as solidly united as before.

Cases of sarcomata and carcinomata of the retromaxillary region, naturally, have many more difficulties. In the first place, they are not so easily enucleated as the fibromata, for they must be traced in the tissues they attack, and if any chance of total and radical removal is present, it is only possible by tracing them with the guiding eye. The malignant growths destroy the adjoining tissues not only by pressure, but by infiltration, and we have, therefore, much more destruction in these cases. We have to be satisfied with impaired functions after recovery. In one of my cases of sarcoma of the retromaxillary region, the history of which I will mention briefly below, this destruction reached such dimensions a priori, not diagnosticated, that the functional result after the operation was very poor.

Case 2.—V. K., 32 years old, a blacksmith, had been suffering for several months. At first his physician called his complaint neuralgia of the face. Later on he detected growth of the uvula and behind the same. He thought it was an abscess, punctured it, but the free hemorrhage showed it was a solid growth. The patient was brought to the Presbyterian Hospital, and on account of difficulty in breathing, tracheotomy was to be performed, but proved unnecessary. An incision was made into the retromaxillary tumor, some fluid withdrawn from the abscess-like growth, whereupon the man could breathe easily. In the hospital an interbuccal operation was tried by the attending surgeon, particles of the growth were removed, but the bulk of it being inaccessible was left behind, and thereupon the growth increased in size and was accompanied by the most excruciating pains.

I saw him after he had been suffering about six months, proposed a radical operation, brought him to the Post-Graduate School, and operated upon him shortly afterward. Osteoplastic resection, in the manner described above, was made, and a tumor of sarcomatous nature, about the size of a child's fist, removed. The lateral wall of the pharynx had been involved, and this was sutured, and healed by primary union, as well as all the incisions. The patient was demonstrated about six weeks afterward before the Chicago Medical Society. At that time there had been no recurrence, but in about six months intracranial symptoms showed that the tumor had not remained local, and the patient died from metastatic growth in his brain a few weeks after. This case again proves the truth of my initial remarks as to the prognosis of malignant growth.

In another class of growths of the retromaxillary region it may be more expedient to operate by temporary resection of the lower jaw. This refers to that class of tumors of the tonsils or parotids which reach into the retromaxillary space with the bulk of their growth. Such tumors are more laterally situated, and more easily diagnosed than those of the former class. It is a question whether this temporary resection of the lower jaw is necessary, or whether such tumors are more easily removed by the inframaxillary route, and either esophagotomy or pharyngotomy are performed. This must be decided by the surgeon in individual cases, according to the extent of the growth. When the bulk is in the upper pharyngeal region, even extending into the attic, it is necessary to sever the lower jaw. When it is more inferior, the inframaxillary route underneath the jaw will be sufficient. A special case described more in detail may illustrate this method of operation of retropharyngeal growths.

Case 3.—Miss H., a school teacher, had been well until about one and one half years previous to the time she consulted me. She had had a tooth extracted from her lower jaw. The extraction was very difficult, and left a thickening of the lower jaw, which was not painful, and not very noticeable. Shortly afterward, however, a growth appeared adjoining this, gradually increasing upward, and became prominent on the left side in front of the ear, but more noticeable as a globular protruberance in the pharynx, pushing the soft palate upward on that side, also the tongue. At first the growth was rapid, but then remained stationary for a time.

She had consulted prominent surgeons of this city, who all agreed in the diagnosis of an osteosarcoma of the lower jaw, involving the adjoining tissues, perhaps the base of the skull, and advised against operation. It was at the time of Dr. Coley's publication on the effect of erysipelas and prodigiosus toxins on malignant growths that I made some experiments in this line in the Cook County Hospital. This case was referred to me by Dr. F. B. Earle, whom the patient had last consulted, as a hopeless case of sarcoma, to be given the benefit of these injections. I injected eight ounces of the erysipelas toxin (Coley) with the result that the tumor grew to such a size that the patient could hardly breathe. The tumor filled up the mouth cavity almost entirely on the side of its origin, and a large portion on the other side. She could neither swallow nor breathe, and begged me to undertake something to relieve her sufferings. I

finally decided to make an effort to remove the growth, even if it were necessary to leave some of the tumor if I could not effect a radical cure, in order to give her a chance to breathe and eat so long as she remained alive. Previous to the operation, which was undertaken at the Post-Graduate Hospital, I ligated the external carotid artery, on the left side, in order to avoid hemorrhage. This I do in all these cases. The external incision was carried transversely along the lower jaw clear down to the bone, the jaw severed at about the middle of its transverse branch, pried open, and the tumor exposed. Strange to say, it was easily enucleated, and proved to be not a sarcoma of the lower or upper jaw, but a tumor of the parotid gland, which had grown with the small portion around the ascending branch of the lower jaw externally, with its largest portion internally, pushing before, behind and upward all the tissues which were in the way. When removed, it was about as large as two

FIGURE 2.

fists. The jaw was adapted, but owing to the large cavity left by the removal of the tumor, it did not unite, and to this fact I attribute the extremely tedious and very disagreeable after-treatment of the case. It had many complications. A short time after the operation I was one night called to the hospital. The ligature of the carotid had cut through, and the interne was scarcely able to control the hemorrhage, which in a few seconds had completely covered the patient with blood. We finally succeeded in controlling it, and the very anemic patient slowly recovered from the operation. The jaw did not unite, being infected, small portions became necrotic, the two fragments placed themselves in an angular position, so the face seemed drawn to one side. The portion of the normal parotid gland had remained, and the ductus Stenonianus having been severed during the operation, large amounts of saliva poured through the cheek. I tried to bring about union of the jaw by means of dental appliances, but for a long time without success. Finally, Dr. Goslee of the Chicago College of Dentistry succeeded in bringing about union, with a very ingenious splint. Prior to this, I operated on the patient for her salivary fistula, dissected the ductus Stenonianus with its outer opening clear down to the rest of the gland, and implanted the opening internally into the angle of the jaw, keeping it there by sutures. In this way I closed the fistula. At the present time, a little over two years after the operation, the patient is well and has returned to her former avocation. The microscopic examination of the growth had shown a mycochondro-sarcoma. Though many operations were done, the disfigurement is not very marked (Fig. 2).

If we review the subject briefly, we must acknowledge that the open method of treating such deep-seated pathologic conditions as retromaxillary tumors is gaining more and more adherents among surgeons. I call attention to an article published by Prof. Jordan, in the *Muenchener Medizinischer Wochenschrift*, bringing forward a new method, which is still more extensive than the ordinary osteoplastic dissection. He even goes so far as to temporarily remove the external nose in order to gain access to the retromaxillary growth, and combines temporary resection of the upper jaw with temporary resection of the nose by Ollier's method. His two cases seem perfect successes, both cosmetically and therapeutically. In one case, he flapped the jaw to one side, the nose to another; in the other case, he formed one flap of nose and jaw to one side. For simple nasal polypi, even of large size, such double operations appear to me unnecessary, as the removal of the jaw in the manner previously described gives perfect success. In cases of malignant growth, however, I should advise laying open as much as possible, even to the extent of flapping both upper jaws to either side and upward, so as to lay bare the whole base of the skull, so far as can be reached by the mouth.

Whenever malignant growths in the retromaxillary region have reached such dimensions that the jaw can not be replaced, and the growth must be removed, we resort to permanent resection of the jaw. This operation, also undertaken with the preliminary ligation of the carotid artery, is very disfiguring, functionally, and cosmetically destructive. From among several cases of this kind, I shall describe one which I consider remarkable, not only on account of the extent of the operation, but also owing to the amount of plastic reconstruction.

Case 4.—Mr. R., about 40 years of age, was referred to my service in the surgical department of the Cook County Hospital. He had removed a tooth on the right side, as it had caused him great pain, but the swelling around the cavity did not disappear. On the contrary it grew after the extraction, and many foudroyant hemorrhages weakened the man. At the same time, difficulties in swallowing existed. On examination, I found a large exulcerated growth of the right side of his jaw, extending over the tonsil, the pharynx, the right side of the tongue—not involving the tongue. The tongue could be easily protruded. The growth, though very extensive, did not involve any of the vital structures, and I therefore decided to remove it radically.

The operation was performed in the same manner as described in the first case, but in addition the jaw was totally removed, also the structures, so far as they were affected. The hemorrhage was very light, compared to the hemorrhage in cases where the ligation of the carotid had not been performed. The accompanying photograph shows the patient a few days after the operation (Fig. 3).

After he had rallied from the operation, the question arose as to the method of covering the jaw defect. The whole cheek, external and internal, a portion of the pharynx, the whole upper jaw and a portion of the lower jaw were missing. The first thing I did was to unite the wound alongside the lower jaw with the remaining border of the mucous membrane of the

FIG. 3.—Rawlins, 45 y. Carcinoma palat., maxill. super., dextr. pharyng. Resectio maxill. super. septi nasal, ossis ethmoid, etc. Cook Co. Hospital, 94. Before plastic operation.

mouth all along the jaw, thus preparing to transform a portion of the neck for a transplantation into the interior of the mouth to form the internal or mucous covering of the cheek. A few days following I inserted this flap in such a manner as to suture the

FIGURE 4.

flap of the neck to the wound of the pharynx and the other side of the palate, leaving a free wound outside, but covered toward the mouth opening. Two weeks later I covered this wound with the outside flap in the following manner: In order to prevent loss of blood, I made a percutaneous suture on the skull, outlining with this suture as large a flap as was necessary to form the cheek. After this suture had been put in the flap was turned down, the pedicle for the same being behind the ear. It was turned down and sutured alongside the eye, the nose around the wing to the middle of the lip, to the inner flap, which came from the neck, then to the lower lip. This was all that was necessary in order to cover the large defect. There was, however, an enormous defect on the skull, which had to be covered by Thiersch grafts. The accompanying figure (Fig. 4) shows the condition about this time. The man stood these operations very well, but his anemia was so great, and the swallowing of the discharges from the suppurating cavities of his mouth produced such destruction of his alimentary tract, that he ran down more and more, and a short time afterward died from septic fever. This case again proves the truth of my statements in the beginning of this article about malignant growths and their operations.

In conclusion, I would say with regard to the operative treatment of retromaxillary growths:

1. Retromaxillary growths should be operated with the open method, that is, osteoplastic resection.

2. To avoid hemorrhage, preliminary ligature of the carotid artery is the safest means.

3. Tracheotomy can be avoided by placing the patient in Rose's position, operating on the hanging head.

4. Non-malignant growths of small size can be treated without resections, eventually with electrolysis. Large non-malignant growths can not be treated otherwise than by resections.

5. Malignant growths of any extent give very unfavorable prognosis, and should not be treated radically except in cases of *indicatio vitalis*.

PERSISTENT HEADACHE.

REMOVAL, FOR RELIEF, OF AN OUNCE RIFLE-BULLET, IMBEDDED IN THE BONES OF THE RIGHT TEMPORAL FOSSA, WHERE IT HAD LAIN UNSUSPECTED FOR THIRTY-FOUR YEARS.

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WASHINGTON, D. C.

Mr. W. G., of Howardsville, Va., at the age of 17 years enlisted, June 16, 1863, in the Second Virginia Cavalry. In the sixteen engagements in which he took part, from that time until July 3, he escaped unhurt; but at the battle of Cashtown, on that date, he was twice wounded. The first wound was in the right shoulder, which, while disabling him as to the use of his gun, did not render him unconscious or drive him from the field; and while cheering his comrades on in the fight, he received his second wound, in the head, which prostrated him and rendered him unconscious for some minutes. He was carried to the rear, and remained as prisoner in the hands of the Federal troops. He was sent to a hospital in Providence, R. I., where his shoulder wound assumed a very serious aspect, and he was in a critical condition for several weeks. As soon as he was able to observe things after regainining consciousness on the field, he noticed that the sight of his

right eye was gone. The wound in the right brow was so trivial that it was almost entirely ignored by the surgeons in their anxiety for the much more serious one of the shoulder. It was generally concluded by the different surgeons who attended him that the injury to the brow was caused by a piece of shell; and as there was little complaint of it at the time, nothing beyond local applications was attempted. The shoulder wound finally healed, leaving a fairly useful arm, and after his exchange he served as courier for more than a year. The small wound in the brow, however, never healed permanently. It would occasionally break out and discharge a small quantity of very thin pus, but there was never any marked tenderness at it or anywhere in its immediate vicinity. The eye remained blind, and in the course of years became painful, and inflamed at times, and there was scarcely ever absent a sense of discomfort and heaviness on that side of the head, which finally

FIGURE 1.

developed into a positive pain on any considerable physical exertion. Though a man of strong physique, this condition, continuing through so many years, finally rendered him unfit for protracted work of any kind. By the advice of Dr. Kleinschmidt of this city, he consulted me in October, 1890, and I found the right eye in a state of partial atrophy, the cornea flatter than normal, pupil closed. The eye was somewhat painful and had been for a long while; T—1; no marked painfulness to touch. There was a small fistula on the upper orbital edge about one-third of the distance from the outer to the inner canthus, from which a drop of thin pus could be pressed. There was no circumscribed tumor at the temporal region. The eye being painful and useless, it was thought best to enucleate it, with the hope that an exploration of the empty orbit might reveal the source of the fistular discharge. Accordingly he was admitted to Providence Hospital, October 16, and the eye was removed. It is to be regretted that when the time came for making a section of the removed ball it could not be found, nor has it been to this day. After the orbit had been freed of the globe, it was carefully explored. Its walls were found to be sound; and a probe introduced into the fistular opening in the brow did not enter it, but passed upward for a short distance over the anterior surface of the frontal bone. The opening was enlarged and a small quantity of necrosed bone removed.

From this operation he derived some, but not a great amount of benefit, and in March, 1892, he again presented himself, asking that something further be done for the relief of the pain in the right side of the head. On March 20, the fistula was again laid open and a tract followed upward over the frontal bone for some two and one-half inches. All the dead bone on the surface was removed by a curette. From this operation he experienced some relief for a year or more, but after that the old pain returned, and finally, in January, 1897, he returned and begged that another effort be made to give him relief from his suffering. As the fistula still continued to discharge at times, it seemed evident that this must be in some way connected with the pathologic condition; and believing that whatever it was, it was the cause of his pain, I determined to continue the search until it was found, and with this understanding he consented to an operation, which was made Jan. 25, 1897, at the

FIG. 2.—Length, 31 mm.; Width, 17 mm.; Weight, 24.9 gm.

Emergency Hospital. Taking the history as it had been given, the only definite idea that could be entertained was that there had been a shell wound, causing a disease of the bone, which was obstinate in healing and which I had not been successful in entirely removing at the other operation. I had this thought, too, that perhaps the frontal sinus had been opened. The discharge may have come from the diseased sinus through a fistulous opening so small as to have escaped detection at the other operation. Accordingly, under thorough anesthesia, the fistula was again laid open to the extent of a centimeter and a half upward. The walls were cicatricial and hard. At the bottom of the fistula and about two centimeters above the orbital ridge, a pocket of necrosed bone was found and thoroughly scraped with a curette, until perfectly healthy bone was reached in every direction. This pocket, which was as large as a very large pea, 7 or 8 mm. in diameter, was perfectly "blind." It led nowhere. The most careful examination with the finest probes did not reveal a passage into the frontal sinus or farther into the frontal bone in any direction. The cicatricial tissue was closely adherent to its edges. It seemed as though we were again to be foiled in finding a cause for the protracted pain, when happening to look at the edge of the recently denuded bone, under a certain angle of light, I noted a bright point of reflection. Examining this more closely, I found it to be a fragment of lead, with a surface about half the size of a

pin-head. Turning to the medical gentleman and students who were present, I said, "This puts an entirely new aspect on this case. There has been a mistake all along. The wound was not made by a piece of shell, but by a leaden bullet. This bullet is no doubt somewhere in the skull and it must be found."

There was nothing to indicate the direction the bullet might have taken. It had left no trace of its passage. The cicatricial tissue around the cavity was firm, and the bone, after removal of the diseased tissue, was healthy. It was among the possibilities that the ball might have glanced against the bone and passed out again either through its place of entrance, or at some point quite distant, as such projectiles have been known to do; or it might be anywhere, the wandering character of the paths of bullets after they have entered the body being well known. The two first possibilities were hardly worth considering and the preponderance of likelihood was of its still being somewhere in the skull. The search was therefore continued by enlarging the incision upward over the frontal bone for seven centimeters, but without result, so far as finding further evidence of the ball or its pathway, the bone being everywhere normal under a normal periosteum. It was then called to mind that the shot had been received while the patient was on foot, the enemy being mounted. The ball would then have a downward direction and when it struck the brow would, in all probability, continue in the same general line. Under this impression, another incision was made downward, in the direction of the temporal bone, and at about 2.5 centimeters from the edge of the excavation and about 5 cm. from the orbital edge, under cicatricial tissue, was found the edge of a mass of lead. I then proceeded to carefully uncover the surface, following its irregular and seemingly never ending course until its terminal extremity was found deep down in the temporal fossa, reaching a considerable distance over the surface of the greater wing of the sphenoid. When it was fully exposed, its surface occupied a space nearly 30 by 12 mm., level with that of the surrounding bones, in which it was so firmly bedded as to form a part of their structure. The surrounding bone was perfectly healthy, without the least suggestion of necrosis. It was evident that the only method of removal was by chiselling the bone from around the imbedded bullet. We were entirely ignorant of the depth to which the bullet had penetrated, but as the skull wall at this part is very thin, the need of great caution was felt in using the chisel and making the effort for extraction for fear of penetrating the cavity and doing injury to the soft parts of the cranial contents. The idea of using a trephine which would embrace the whole of the bullet and surrounding bone was rejected—on account of the situation of the foreign body and the danger of its use—as less practicable than a careful use of the chisel, particularly in hands which were accustomed to its use. The chisels used were those of Schwartz, which I always employ in operation on the mastoid. It became apparent very soon after the chiseling had begun that it would be necessary to make a channel entirely around the mass, for everywhere the bone and lead were entirely welded together. In some places the bone had overlapped the lead by 2 or 3 mm., and everywhere had inserted itself into each crack and cranny of the very rough and irregular surface of the mass, holding it as tightly as if they had been moulded together. For this reason it was found necessary to run a channel of a depth equal to the thickness of the mass all around it, this reaching at some points a depth of nearly 1 centimeter. At length, however, the mass was felt to be loose, and it was carefully pried from its bed. It had been resting upon apparently perfectly sound bone, somewhat discolored by the lead, but bearing as exact an impress of every line and undulation of the under surface of the bullet, as if it had been made in wax. If there had at any time been a fracture or penetration of the bone, there was no evidence of it now. There had been but little hemorrhage during the operation, three vessels only requiring ligation. The cavity in the bone was filled with iodoform gauze and the edges of the skin around brought together, leaving a drainage at its lowest part. The whole operation consumed two and one-half hours.

The patient came promptly from under the anesthetic, and there was at no time during convalescence a rise of temperature one-half a degree above the normal. The wound was dressed three days afterward, and no pus found; nor was there any during the whole course of healing. He was discharged from the hospital February 3, and a few days thereafter the photograph, of which Fig. 1 is a reproduction, was taken. The bullet, which was a regulation ounce minie ball, had probably lost something of its substance before striking him, for it weighed only 24.9 grains. Its length was 31 mm., width at its widest part 17 mm., and it was 1 cm. thick at its thickest part. (See Fig. 2.)

Immediately after the operation the patient felt relief from his head symptoms and this relief has continued until the present time (July, 1898). His own words are: "I am a new man."

It is not my present purpose to enter into a discussion of the general question of the bullets imbedded in bone, but I shall limit myself to pointing out the prominent and interesting features of this particular case. The marvel is that such a mass of lead coming with a velocity sufficient to penetrate the skin, should not have entered the skull or at least caused an extensive fracture of its walls. The probable explanation of this is that it was a spent ball, struck the brow obliquely and, passing under the skin, had not enough force remaining to make its way out through the thick temporalis muscle. It hardly seems possible that it could have penetrated the bone. There was no sign of fracture either at the bed of the bullet or at the point of entrance at the brow. How was it then, that the ball was found entirely surrounded and firmly embedded in osseous tissue? The whole appearance and history indicates that there was a slow proliferating osteitis, set up by this foreign body, causing new osseous material to be thrown out around it. In no other way can we account for the complete union between the bullet and the surrounding bone. It is rather remarkable, in view of this, that there was at no time any marked circumscribed swelling in the temporal region or other symptoms pointing to trouble in this part, except the fact, which he now recalls to mind, that there were times when it was difficult for him to open his mouth, and sometimes it could not be opened wider than to admit his finger. This was no doubt due to the painfulness of the temporalis muscle in the act of mastication. He had been examined by many surgeons, both during and subsequent to the war, and the

theory of the shell wound was, he says, universally adhered to. As regards the blindness, that is readily accounted for in the same way that sudden blindness following blows around the orbit are now commonly explained, by a fracture of the optic foramen with a consequent pressure on the optic nerve. The subsequent inflammatory affection of the eyeball leading to a partial atrophy is not so easily accounted for, but is most likely due to a continuation of the morbid process set up at the time of injury. The pain, of a neuralgic character, which was so persistent, was evidently due to the pressure of the mass of lead on the nerves of the bone, the removal of which gave instant and permanent relief.

I am indebted to Dr. A. R. Shourds for assistance during the operation, and to Dr. Ritchie Stone, of the Lionel Laboratory of the Emergency Hospital, for the photographs from which the figures are taken.

HEADACHE FROM NASAL CAUSES.

WITH SOME ILLUSTRATIVE CASES.

Read before the Cincinnati Academy of Medicine, Sept. 19, 1898.

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Headache is one of the common symptoms of patients with diseases of the nose. So frequently is it found associated with obstructive lesions that its presence and its cure by operation are everyday observations of the rhinologist. But no one has yet systematically reviewed the clinical histories of these cases and given us a clear description of of the symptom, so that one not an expert in this special line could recognize the cause of the pain from the patient's statements. The present paper is an attempt to furnish some needed data for the accurate diagnosis of the cause of headache. A symptom so common and often so obscure in its etiology is deserving of our most careful study. There is nothing so obstructive to the true progress of medicine as false statistics and deductions, drawn from improperly observed and recorded cases. In order that the reader may judge for himself whether my conclusions are properly drawn, I shall report briefly, typic cases, illustrating each disease in the nose that may produce headache as a symptom.

Miss F., aged 18 years, poorly developed, anemic and badly nourished, is a student of music and very ambitious. The hours of confinement and the tension of piano practice have greatly increased her nervousness. There is a noticeable lack of self-control. Her nerves are all hyperesthestic. She is a mouth breather, with little discharge in either nose or throat, and no cough. She has suffered for five months from a constant headache. The pain is usually over the eyes but radiates to the temples and extends at times to the scalp. It is greatly increased by an attack of acute rhinitis when she "catches cold." Examination of the nose shows the middle and inferior turbinated bodies on both sides, chronically congested and with beginning hypertrophy. Intense pain was produced in the supra-orbital region by touching the middle turbinated bodies with a probe. This pain and the chronic headache were temporarily relieved by cocainizing the nostrils.

This then was a typic case of headache caused by hypertrophic rhinitis. The turbinated bodies were cauterized with the galvanocautery and the patient given a menthol-camphor spray to use at home. The headache was cured in three weeks. Treatment was continued six weeks longer to restore nasal respiration. I was unable to control the patient's manner of living, so there was little change in her general condition. The symptom for which she sought treatment, the headache, was entirely relieved.

Headache is not nearly so common a symptom in atrophic rhinitis as it is in the hypertrophic form. It occurs in a few cases. Mrs. N., aged 27, married, mother of two children, is an illustrative case. Like most patients where the respiratory function of the nose is impaired, she is feeble and poorly nourished. Tenacious, offensive crusts accumulate in her nose and are expelled at intervals of two or three days. She has had for months a dull aching pain over the forehead. The throat is dry and a tickling sensation causes frequent and violent spells of coughing. Examination of the nose shows only irregular ridges where the turbinated bodies should be. The nasal mucosa is purplish in color, from venous congestion. The pharynx and larynx are glazed and congested. Examination of the lungs showed chronic bronchitis affecting the larger bronchi. The patient was told how to use alkaline lotions in cleansing the nose. She was given a spray containing oil of eucalyptus and menthol. Twice a week direct applications were made to the pharynx and larynx, the remedy used being determined by the condition present at the time of treatment. The chronic bronchitis was treated partly by internal remedies and partly by tracheal injections. With the relief of the nasal congestion the headache disappeared. All other symptoms were relieved by a three months' course of treatment, but the destruction of the tissue in the nose was so great that a restoration of function was not possible.

Shelves or spurs growing from the nasal septum and pressing on the turbinated bodies are a very common cause of nasal headache. When present in patients with hypertrophic rhinitis, the headache is especially severe. One case out of many will illustrate this point: Miss G., aged 23 years, is the daughter of a physician in comfortable circumstances, whose health is good with the exception of her nasal trouble. For nearly three years she has had a constant pain as though a constricting band were tightly drawn around the forehead. The pain varied in intensity, but her waking hours were never entirely free from it. Every remedy known to internal medicine had been tried, but without effect. Examination of the nose showed a long irregular spur low down in the left nostril. It grew from the septum but was embedded in and adherent to the inferior turbinated body. This growth was removed under cocain anesthesia. There was considerable trouble in the after-treatment of the case in preventing adhesions forming between the wounds on the septum and turbinated bodies. In ten days this difficulty was overcome and the patient was free from pain. Her face lost the look of constant suffering it had worn, and she returned to her home, cured of a headache that had defied other treatment for nearly three years.

In patients with atrophic rhinitis, large spurs or exostoses often exist without causing any symptoms. In such cases no operation is needed. In others the exostoses are large enough to press on the remaining turbinated tissue and cause great suffering. J. S. H., a merchant aged 40 years, and a robust, well-developed man, consulted me in March, 1897. He had

suffered all the previous winter from a headache which finally became so severe that he could no longer attend to his business. On the advice of his physician, a homeopathic practitioner, he went to Florida in January. While there the headache disappeared. After a six weeks' stay he returned home and at once began to suffer again from intense headache. I had previously relieved a daughter of his from headache, by removing adenoids. As infinitesimal medication was giving infinitesimal results, he decided to change treatment and consulted me concerning his case. I found a large exostosis growing from the vomer and pressing upon the posterior portion of the inferior turbinated body. The nose showed the changes characteristic of atrophic rhinitis. Operation was advised and refused, but a few days more of suffering caused a change of opinion on the part of the patient and the exostosis was removed. Before he left the office he said. "Doctor, you have set every tooth to jumping but my headache is gone." It has not returned.

A thin, deflected septum that presses on the turbinated bodies may also cause headaches severe enough to seriously interfere with the patient's health and usefulness. John M., aged 38 years, is a race track employee, who has twice been sunstruck, but his medical history is good in other particulars. I saw him first in February, 1898. He had suffered from headache, chiefly over the left side of the head, for months. The pain was continuous throughout the day and interfered with his rest at night. The mouth breathing and consequent dry throat also interrupted his sleep as he was often wakened by a choking sensation. His strength was failing from the long-continued pain and inability to sleep. The nasal septum was deflected until it pressed on the middle and inferior turbinated bodies of the left side. There was no thickening. The patient was operated on at the Presbyterian Hospital. Under chloroform anesthesia, crucial incisions were made through the septum, with the Asch scissors. The septum was then forced over to the median line with forceps, and nasal tubes inserted. The operation was a very bloody one. The patient suffered severely for a week after the operation, but by that time the acute inflammation had subsided and the nose become accustomed to the tube. The patient's temperature was 102 degrees F., once during the convalescence. After the first week he improved rapidly. The tube was worn five weeks and then left out. The septum retains its position near the median line. He can sleep until morning without waking, and has regained his usual health and strength. The only unfavorable feature of the case is a small perforation of the septum where the incisions crossed.

Perforations of the septum nasi ordinarily give no trouble. In some cases attacks of acute rhinitis cause ulceration at the margins. This ulceration is painful and the pain is generally referred to the supra-orbital region. A. M. was a soldier in the Civil War, who, as a result of exposure, had hypertrophic rhinitis. The decomposing secretion from this diseased area irritated the skin covering the septum in the vestibule of the nose and set up an eczema. The fissures of eczema became ulcers and resulted in a perforation. Syphilis could be excluded in this case by the history and the man's general health. The catarrh had existed for twenty years with little treatment before he came under my care. He was a patient of mine at intervals for ten years. When he had a severe acute rhinitis, the upper posterior margin of the perforation would ulcerate and sometimes a bit of cartilage would become necrosed. This process was always accompanied by severe headache, the pain being supra-orbital. A salve containing 10 per cent. of boracic acid would ordinarily secure rapid healing of the ulcer and relieve the headache.

Polypi are the most common neoplasms in the nose. They often cause severe headache. C. K., a very robust, hearty German, consulted me first in 1894. He had suffered for months from a headache that continually increased in severity in spite of the treatment given by his family physician. The pain was most intense in the early morning. It gradually lessened as the hours passed until in the afternoon he was comparatively comfortable and could attend to business. Examination of the nose showed the upper part of both fossæ filled with polypi. They were immediately removed. At the patient's next visit he reported that the headache left him in a few hours after the removal of the polypi. He was seen at intervals of a week for a short time and the small polypi that grew around the base of the larger tumors destroyed. In 1897 he again came under my care with a catarrhal trouble. There had been no return of the polypi and no recurrence of the headache.

No benign growth causes as much destruction of tissue in the nose and as much suffering as a fibroma. Membrane, cartilage or bone becomes necrotic under the pressure of these tumors and the destructive process causes agonizing pain. The same statement applies to the later stages of sarcoma in the nose. It has been so short a time since I presented the specimens and case histories of both these conditions to the Academy, that I shall not again enter into details.

Tertiary syphilis appears in the nose in one of three forms. You may find it as a gumma, a deep ulcer or a necrosis of the nasal bones. Sometimes the three conditions are coincident, although this is not common. Any one of the three may be attended by severe headache. When a gumma is present, the headache usually comes from pressure on the turbinated bodies. In deep ulcer, the headache is produced by the intense inflammation of the tissues around the border of the ulcer. In necrosis of the nasal bones, the headache may also be caused by an inflammation of the adjacent tissues. I have sometimes thought it was in part due to the chronic septicemia with consequent anemia in these cases. Mrs. L. M. consulted me in October, 1897, having suffered for years from syphilis. When examined there had been an almost complete destruction of the posterior portion of the triangular cartilage. Projecting portions of the dead vomer could be seen through the mass of granulations and polypi that surrounded this portion of the septum. There was a small gumma on the posterior portion of the left middle turbinated body. The discharge from the nose was very abundant and exceedingly offensive and the patient's sense of smell was entirely gone. She was suffering intensely from headache caused by the disease in the nose. The granulations and polypi were removed by the snare as rapidly as possible. The vomer was removed by forceps and snare at two sittings. A little later it was necessary to remove a portion of the middle turbinated bone which had become necrotic under the gumma.

The patient used cleansing sprays and a spray containing oil of eucalyptus several times daily to clear

the parts of the discharge and to remove the offensive odor. After three months' treatment, there was a complete cure of the ulceration and final relief of the headache.

The slow growth of a rhinolith may cause no symptoms while the stone is small. When it becomes large enough to press on the turbinated bodies, headache is added to the symptoms of obstruction already present. Ed. B. was referred to me in October, 1895, by his family physician. He is a clerk, has had syphilis and drinks to excess. He has never been able to breathe through his left nostril since he was old enough to note and remember his own condition. The obstruction was attributed to a fall from his nurse's arms when an infant. He has suffered from headache for years. For three months before I saw him he had been unable to work because of this pain and the condition of the left eye. The eye was injected, watery, and the pupil almost closed, responding very slowly to light. So intense was the pain and injection in the eye that I feared an iritis. The nasal septum was deflected to the left and thickened so the interior of the nostril could not be seen. A probe passed along the floor of the nose encountered a foreign body with the feel of necrotic bone. A portion broken off with a small pair of forceps showed it to be a rhinolith. The remaining portion was drawn down and pushed back into the nasopharynx and removed through the mouth. The hemorrhage from the granulations surrounding the rhinolith was so profuse as to obscure the field and prevent any further interference at that time. A few days later the thickened portion of the septum was removed with the saw. The result was a cure of the headache and the ocular symptoms.

In tropic or subtropic countries, flies occasionally deposit their eggs in the diseased nostrils of animals or human beings. The recorded cases of parasites in men show that the growth and activity of the maggots cause the severest headache and wildest delirium. It has been my misfortune to encounter one such case: J. B. had a sarcoma of the nose that operation had failed to benefit. He refused to remain in any hospital. His surroundings in a tenement home were so dirty and unsanitary as to defy description. The nursing consisted chiefly in Irish lamentations over his unfortunate condition. The proper fervor was obtained by copious draughts of corner grocery whiskey. The flies were attracted by the odor of the sloughing sarcoma and the nose twice became infested with maggots. Their presence greatly increased the headache from which the patient suffered. They were easily destroyed by injections of diluted chloroform.

Foreign bodies in the nose may cause headache by pressure on the turbinated bodies. Where the foreign body swells by absorbing moisture, the pain is usually most severe. A girl six years old was brought to me in 1888, by her mother, with an offensive discharge from the right nostril and pain over the corresponding eye. The left nostril was normal. The diagnosis of foreign body was made in spite of the child's denial that she had put anything in the nose. The membrane in the right nostril was so swollen that nothing could be seen. The use of the probe for diagnosis was not allowed. Directions were given for cleansing the nose. A boracic acid salve was used for its effect on the inflamed membrane. At a subsequent visit a small black spot was seen in the nostril. I had by this time gained the child's confidence so she would permit the use of the instruments. The black substance was grasped by forceps and a roll of cloth an inch long removed. The headache and offensive discharge was cured in a week.

Purulent inflammation in any of the accessory sinuses of the nose is attended by severe headache. Mrs. S., aged 55 years, had suffered for twenty-five years from headaches of great severity. She would often be confined to her bed for days by one of these attacks. For three years the pain had been continuous. She was weak and feeble from the pain and consequent loss of rest and nourishment. Her husband, a physician, had given her every attention, but the severe attacks became worse and more frequent. Her memory was failing. The diagnosis of nasal headache was made by Dr. Heady and the case referred to me for operation. The middle turbinated body on the left side was hypertrophied. Some pus could be seen below it. The patient said when there was a free flow of pus from the nose she would have little headache. When the discharge decreased she would have a violent attack. The anterior portion of this diseased tissue was removed with a snare at her first visit. This gave some relief. There was a rapid return of the obstruction and at her next visit in removing it I felt dead bone beneath the diseased membrane. The bone was removed with snare, forceps and curette. A free opening into the anterior ethmoid cells was made in removing the necrotic bone. There was a thick offensive pus in the cells. The opening was kept clear of granulation until the membrane healed over the edges of the wound. Permanent drainage of the cells was thus secured. There has been no headache since the cells were freely opened.

Probably every adult has experienced the severe headache which is caused by the extension of the inflammation in an acute rhinitis to the frontal sinuses. The condition is too well known to need elaboration. Much can be done in these cases to secure drainage and consequent relief from pain by intranasal treatment. R. H. C., aged 37 years, sent for me to see him at his residence, in December, 1896. I had removed a large spur from the right nostril some months before, and found him in bed suffering from very severe pain over the left eye. The whole left side of the face and head were congested and the scalp tender. His temperature was 102 degrees. The left nostril was completely filled by the inflamed turbinated bodies. These were contracted as much as possible by the free use of a cocain solution. A hot water bottle was applied over the forehead and codein given internally. A menthol spray was ordered to be used every three hours. At the end of twenty-four hours there was no improvement, so, in addition to the use of cocain, the engorged membrane was freely scarified about the lower orifice of the infundibulum. This treatment was followed by a free discharge of offensive pus and a cure of all the symptoms.

Chronic empyema of the frontal sinus may cause headache for years. Miss K., aged 22 years, came under my care in 1896. She had atrophic rhinitis and suffered for two years from headache over the left eye. There was some swelling over the forehead in this region and the swollen portion was tender on pressure. The middle and inferior turbinated bodies in the left nostril were adherent. Pus was discharged

through a fistulous opening in the middle turbinated body. The case was one where the frontal sinus should have been opened externally, but this operation was declined. All I could do was to remove the granulations and polypoid tissue about the fistula from time to time. So long as the pus escapes freely there is relief from pain, but a cure in this case is not possible without a radical operation.

The gravest symptoms produced by empyema of any of the accessory sinuses of the nose occur when the sphenoidal sinus is involved. S. M., aged 28 years, came to me in 1894 with a gumma in the nasopharynx. The swelling had blocked the orifice of the sphenoidal sinus, which was inflamed and full of pus. She was wild with pain, which radiated, as she described it, from the center of her head. She staggered as she walked, and vision was impaired, particularly in the left eye. Her temperature was 104 degrees and she had severe nausea and vomited her food. Opiates were given liberally. Large doses of potassium iodid were also ordered. The medicines gave no relief and at the end of forty-eight hours an opening was drilled in the anterior wall of the sinus. With the discharge of pus, immediate relief was given and all the acute symptoms disappeared in a week.

When a patient with hypertrophic rhinitis has an attack of acute inflammation, the ventilation of the antrum of Highmore is sometimes stopped. This is especially true if the membrane in the hiatus semilunaris is involved in the hypertrophy. Mrs. S., aged 38 years, consulted me in June, 1897, with this condition present. She had severe pain over the infraorbital and supraorbital regions of the left side. All the teeth in the left upper maxilla were aching. She was nauseated from pain and loss of sleep. Her temperature was 102 degrees. The middle turbinated body and the membrane about were thoroughly cocainized. An attempt to probe the orifice failed. The tip of a probe-pointed knife was then thrust through and its withdrawal was followed by a gush of mucus. This gave immediate relief. It was necessary to reopen the orifice the next day. After this time it remained patulous and with the appropriate treatment of the rhinitis there has been no further trouble.

So far in this paper, with one exception, I have reported only uncomplicated cases in order to give a clear idea of each cause for nasal headache. In practice, two or more pathologic conditions are often found associated in one case. All must be cured before the headache is relieved. Alois S., aged 40, years, a robust stolid German, consulted me in November, 1897, and gave a history of obstructed nostril for two years. Headache had been constant since the obstruction was first noted. A number of polypi had been removed from the left nostril by another physician six months before I saw him, but there was no relief of the headache. For three months he had suffered from nocturnal asthma. It was for the relief of this he again sought nasal treatment. I removed the recurrent polypi and found behind them a large exostosis on the vomer. This growth was imbedded in and adherent to the inferior turbinated body. The bony growth was removed with the saw. Six weeks' treatment cured both the asthma and the headache and there has been no recurrence.

Chronic nasal headaches begin as intermittent attacks of pain. Colds or unusual excitement bring on the painful periods with increasing frequency and they last longer than the earlier attacks. By the time nasal stenosis has become a prominent feature in the case, the pain has become constant. There are great variations in the severity of the headache after it has become continuous. Sometimes the exacerbations are at intervals of two or three weeks. In other cases there is a daily recurrence of hours of suffering and a time of comparative ease. These cases are the ones most likely to be mistaken for malarial neuralgia. The most common description of the pain by the patient is the statement that there is a constant dull ache over the root of the nose and over the eyes. In severer cases the usual complaint is of a band drawn tightly around the head above the eyes with an ever-increasing pressure. In other cases the pain may be referred to the temples, the scalp or the eyes. The patient's general health suffers from the constant pain. Insomnia is a frequent complication in bad cases. The patient becomes irritable, faultfinding and peevish. In a few cases a morbid dread of insanity has been noticed. A partial loss of memory and of mental vigor, noticed by the patient himself, may increase the tendency to melancholia.

The disease in the nose which causes the headache is usually complicated by catarrh of the nasopharynx. pharyngitis, laryngitis, and bronchitis. The mucopurulent expectoration, cough and dry throat in the morning are valuable symptoms. If understood, they direct the physician's attention to the nose as the site of the primary disease. The coated tongue of obstructive disease in the nose is apt to be misleading. Where the doctor in his own mind always associates a coated tongue with dyspepsia he will treat a nasal headache as one caused by some disorder of digestion. This mistake in diagnosis and mortifying failure in treatment can be avoided by remembering that a coated tongue means mouth breathing more often than it indicates dyspepsia.

Where the headache is caused by an acute inflammation in the nose, the suffering is greater than in the chronic cases. It lasts only a few days unless some chronic inflammatory disease underlies the acute process. There will be some fever during the attack with all the well-known general symptoms of that condition.

The diagnosis of headache from nasal causes will be suggested by the history of catarrhal symptoms and long-continued pain. Direct examination of the nose will show evidence of one of the causal diseases already described. If cocainization of the nasal mucosa gives temporary relief of the headache, there is greater probability that the cause is some disease in the nose. Touching the affected area in the nose with a probe often increases the pain if the headache comes from this cause. Those tests, though, are not always diagnostic. We must sometimes depend on the results of treatment for a positive diagnosis. I have treated a case with marked hypertrophy of the middle turbinated bodies without benefiting the headache, which was later found to be due to granular nephritis.

The treatment of nasal headache is the cure of the causal condition in the nose. The methods of treatment for each cause can be found in any good work on rhinology. In a few cases, some general treatment must follow local measures. Ordinarily this is not needed. With the cure of the nasal disease, the headache disappears. The general health improves rapidly. The mental and moral condition of the pa-

tient undergoes a decided change for the better. There are none more grateful than those, who, after years of suffering, have had the "iron band" of a nasal headache removed from their brows.

CHRONIC GENITO-URINARY DISEASE.

REFLEX NERVOUS MANIFESTATIONS CONNECTED THEREWITH.

BY WILBUR F. STORMAN, M.D.
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During the past few decades the advancement and progress of invention and discovery has been marvelous indeed, and as usual, the "Yankee" justly claims his as the lion's share.

To no branch of science does the foregoing apply more forciby than to the different branches of medicine and surgery, as a whole. In fact, the discoveries of pathologic causes and processes, and their prohibition and prophylactic therapeutics have almost revolutionized the science of both surgery and medicine, and placed us at present upon a basis from which we can assert that our maligned profession is much nearer an exact science than at any other time in its history, and that the day of empiricism is practically past.

In contradistinction to the geologic and other histories of the past being divided into "Ages" the present is called the "Electric Age," and it might be appropriate for us as members of the most noble and philanthropic of all professions, to call it the "Medical Age," since no member of the other professions will ever accord it to us without the asking, I assure you.

While we must and do admit that the discoveries in electricity and their application and use have furnished many conveniences and necessities for the use and comfort of the toiling millions and pleasure-loving gentry, none (with the exception of the Roentgen ray, and the few other medicinal and diagnostic uses of electricity) have ever served to save a human life, or add a year to its length, or to ameliorate and soothe the pangs of pain and human suffering. *Per contra*, however, they have almost invariably added to the wretchedness and absolute dependence of the poor of the land upon the grasping hand of capital for their meager existence and their daily bread.

I desire to call attention to the fact (in my opinion), and to assert, that taken in their broadest sense, and viewed from a clinical and diagnostic standpoint and causative factor, in all forms of nervous disorders and affections, including insanity, hysteria, melancholia, all the different forms of mania, and the entire category whose name is legion, in a *majority of cases* the cause may be traced to some functional or organic pathologic condition of the generative or urinary organs, usually the former. What proportion of the inmates of our lunatic asylums have been addicted to vicious habits, sexual excesses and sexual pernicity and disease?

I have hanging in my office a life-size reproduction of a dissection by Byron Robinson of Chicago (my genial professor of abdominal surgery and gynecology), of the entire sympathetic nervous system, and its various spinal and cerebral connections, which clearly and plainly shows even to the laity, how a pain can be reflected and made apparently manifest at any distant part of the nervous economy. For example, let us take a diseased condition and disordered function of the pudic nerve—admitting it to be by far the most sensitive portion of the nervous organism of either sex, and the sensation of irritation and pain is transmitted directly to some distant part. It may first be sent to the sacral, or to the solar plexus, the "abdominal brain," thence to be reflected to the loin, side, back, hip, pleura, heart, lung, or to some other equally unsuspected locality, and in this manner we can account for many of the so-called neuralgias, backaches and headaches, and many gastric and cardiac disturbances as well. Consider for a moment a nervous system diseased in this locality, with the entire system constantly supplied with impure and waste-laden blood, thereby impoverishing the general nutrition and health, while every nerve is crying out against the devastation and ruin being wrought, through the central and ganglionic neurons and peripheral bulbs, and their thousands of connections and ramifications everywhere. Any form of specific or pathogenic micro-organism, if deposited by any means within the vagina of the female, may at once be transmitted and carried directly within the peritoneal cavity, and there deposited, producing acute local or general peritonitis, ovaritis, salpingitis, perisalpingitis, endosalpingitis, oöphoritis, perioöphoritis, endometritis, metritis, cervicitis or vaginitis, or by being lodged within the urethra of either sex, may result finally in chronic cystitis, nephritis, pyonephritis, and in the *male* may involve the cord, testes, anterior or posterior urethra, Cowper's glands, or the prostate. Any one of these is certain to produce pain, and that pain is almost certain to be reflexed through the various plexuses and the ramifications of the sympathetic system to distant parts, and simulate true nervous trouble there.

The treatment of these conditions, in order to be in any way successful, must be rational in every sense. The first important factor must be the recognition and removal of the cause, no matter whether it be medical, surgical, gynecologic, or what not. It must be removed before any permanent good can be accomplished and maintained. So long as anabolism is in abeyance, with catabolism in the saddle, and the sensitive nerves are thus poisoned and irritated with effete material and waste-laden blood, through lack of proper oxidation and decarbonization and insufficient elimination of the toxic principles of the normal metabolism of the entire human economy, just so long will we meet with failure in our treatment of all forms of nervous affections, and until we can look well to the re-establishment of the normal physiology of the body, and to the opening of the avenues of elimination of all these toxic irritants thus retained, our medication is a failure, and our treatment impotent of any permanent value. And along this line I desire to claim that not only should the specialist be able to recognize and diagnose these various abnormal conditions, but he should be able to successfully combat and correct them, as a rule, no matter whether they be ordinarily relegated to the surgeon, the gynecologist, or to the genito-urinary specialist, presuming that they usually entail minor operative procedures only.

Excellent results may usually be obtained in many cases, however, by the use of medicaments alone, eliminants, saline hydragogues, the tonic arseniates, alteratives, such as iridin, iodid of potassium, baptisin and sanguinarin, and where torpidity of the liver and bowel is a factor, by the addition of leptandrin euonymin, or podophylotoxin, aloin and belladonna, while many cases may be stimulated by the use of anemonin, helonin, macrotin, or caulophyllin

combined with the amorphous hyoscyamin, cicutin or croton chloral—where there is spasmodic contraction of the pelvic organs, or pelvic viscera, producing much pain.

A correct and exclusive diagnosis once established, followed by a conservative and judicious tonic alterative soothing and eliminative treatment, means much in a vast proportion of all forms of reflex nervous manifestations due to pathologic conditions located here, and many times both hidden and unsuspected.

Here too, in this connection, is indicated the different forms of electricity, massage, mechanic vibration and hydrotherapy, so ably advocated in the columns of the JOURNAL of April 30, 1898, by Dr. Curran Pope, in his classification of "Chronic Cases." Therein, however, he fails to mention these, which I consider of prime importance, and the most prolific source of all forms of disease, productive of chronic nervous disorders. Though syphilis may be transmitted through other sources and gain entrance through other channels, in a greater percentage of cases its specific virus is deposited during sexual intercourse, entailing much hidden trouble, masked symptoms of various kinds, and by the formation of gummata, in time producing epileptiform convulsions and other phenomena by its interference with the proper function of the brain, the very citadel of life itself.

The enormous area of the peritoneum and its comparatively unknown physiology and pathology, render it also a good field for study and pioneer research in this connection. All these and many more I could mention if considered necessary, in order to sustain me in the position I have taken, that these should be placed at the *head of the list* as causative factors of nervous manifestations of chronic disease.

HYDROTHERAPY IN STOMACH DISEASES.

Read before the Mississippi Valley Medical Association, Nashville, Tenn., October 11-16, 1898.

BY GEORGE D. KAHLO, M.D.
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It is universally conceded that water is essential to the performance of all physiologic functions; yet its importance as a remedial agent is not, I think, so generally recognized.

The tendency in modern therapy is toward the employment of natural rather than artificial agencies, and nowhere have these principles a wider or more fruitful field of application than in the treatment of diseases of the stomach. While I do not wish to be understood as entirely opposing the use of drugs in these affections, as unquestionably they often exert a most beneficial influence, I desire to say emphatically, that I believe water ranks first among all our therapeutic resources. It may be used internally as a drink, in lavage as a douche and as a spray, and externally, either applied locally or generally. Its effects when administered internally will depend upon the condition of the stomach in respect both to the taking of food and to whether or not there is normal digestion, as also upon the amount and temperature of the water ingested.

As is well known, a healthy stomach, when fasting, is markedly contracted; this, together with the relative elevation of the cardiac extremity, greatly facilitates the rapid passage of fluids into the duodenum, and but very little absorption takes place before reaching the intestinal canal. Primarily, therefore, the drinking of water under such conditions will be to cleanse the gastric mucous membrane, and at the same time to act as a stimulant to secretions and to peristalsis. Secondarily, there is heightened arterial tension, accelerated heart action and an increased activity of the kidneys and skin.

Cold water is the more stimulating to secretions and is a better laxative. Hot water has a greater influence as a diaphoretic and in increasing the biliary flow. It is also more soothing to the gastric mucous membrane, is a better solvent, is more rapidly evacuated and is therefore, the more generally applicable as a therapeutic agent. The effects produced in pathologic conditions differ somewhat from those of the normal state, and a successful hydrotherapy must take cognizance of these distinctions. The condition furnishing the greatest indication for the drinking of hot water is gastritis, and in properly selected cases, its employment will be attended with the most beneficial influences, but it must be strictly limited to those in which the motor function is still intact. Wherever there is enfeebled motility, with retention of digestive products, the drinking of large quantities of water will only aggravate the symptoms already existing. To secure the best effects the water should be as hot as can be borne with comfort; it should be sipped very slowly, and from eight to sixteen ounces should be taken an hour before each meal and at bed-time. In this way it removes the excess of mucus, stimulates a healthy secretion and puts the stomach in the best possible condition to perform its natural function. Besides these local influences, by stimulating a healthy activity of the kidneys and skin, it removes effete products, to the presence of which are due the various phenomena of disturbed metabolism which we so frequently find associated with all digestive disorders.

Almost equally beneficial results are to be obtained in some of the purely functional conditions, as in gastralgia, and in the various secretory disturbances associated with normal motor activity. In myasthenia with diminished secretions, small quantities of cold water are sometimes useful in promoting a healthy glandular and muscular activity.

The effects of mineral water of slight concentration are in the main those of the ordinary potable water and are due more to the mode of administration, the purity and quantity of the water ingested than to its chemic composition. In certain patients they possess distinct advantages in the fact that because of their supposed medicinal properties greater confidence is felt in their efficacy, and more attention is given to carrying out the details of the treatment prescribed. The therapeutic uses of the stronger mineral waters are chiefly those of their constituent substances.

Carbonated or acidulous waters, owing to their palatability, are very popular as table waters. They are stimulating to the gastric mucous membrane, will improve the appetite and exercise quite a decided influence on the urinary excretion. They are recommended in gastric neuroses and in atony. In small quantities they will often relieve nausea and vomiting, but when taken in large amounts are apt to give rise to distension and eructations.

Chlorinated waters also act to increase the secretions, and according to Ewald, are indicated in all cases of gastric catarrh with diminished secretions, either with or without the production of mucus (Hemmeter).

Sulphated or bitter waters are saline waters con-

taining sodium or magnesium sulphate, and it is to the presence of the latter substances that they owe their chief therapeutic property, which is as a laxative. They are useful in the treatment of chronic constipation, but because of their depletory influences, should not be employed in cases presenting anemia or marked debility.

Alkaline waters are employed quite extensively in the treatment of gastric diseases. In small quantities they increase and in large quantities diminish the secretion of hydrochloric acid. They are used in hyperacidity and gastric ulcer, but an objection to their employment is that when taken in considerable quantities they are apt to impair the appetite. The various lithia waters are of this class, and, while the percentage of carbonate of lithium which they contain is undoubtedly small, they are very useful as eliminating agents. Better results are to be obtained from the natural than the artificially prepared waters.

Chalybeate waters are supposed to be of benefit in cases associated with marked anemia, but unless they can be taken at the spring their employment is not to be recommended.

Lavage, like other forms of internal hydrotherapy, while possessing many things in its favor, has certain well-defined limitations, and it is no doubt owing to its too indiscriminate use that it has lost much of its former popularity. It is indicated in exactly those conditions which furnish the chief contraindication to the administration of water as a drink; namely, in dilatation and retention. In gastrectasia, from whatever cause, it is a sovereign remedy, and in the earlier stages of this affection a few applications will sometimes effect a complete cure. Next to dilatation it is most frequently used in chronic gastritis, and Fenwick advises its employment in the gastro-intestinal catarrh of infancy, but it has a very limited application in dynamic affections. Ordinarily, plain water a little above the body temperature is used, but various medicinal solutions are occasionally substituted. The addition of a small quantity of salt is of advantage when there is diminished secretion with excessive mucus, and bicarbonate of soda solutions are employed in hyperacidity. In the majority of cases it is best to wash out the stomach in the morning before breakfast, for, besides its remedial influences, it has certain diagnostic advantages. In hyperacidity it is sometimes more effectual just before retiring.

The gastric douche does not differ materially from lavage, except that instead of the tube having but one or two large openings, there are many small ones, and the solution is introduced under somewhat greater pressure, the effect being a kind of internal shower-bath. It is advised particularly when using antiseptic solutions, but a much better method under these circumstances is that devised by Einhorn in the gastric spray. In this, the solution enters the stomach in the form of a fine spray, and besides being more widely disseminated, a minimum amount of antiseptic is employed and there is less risk of toxic symptoms.

Externally, water may be applied locally, either directly or through the intervention of some secondary substance. The most common application is in the form of the wet compress, but to be effectual it must be maintained at a nearly uniform temperature, which necessitates frequent renewals. It is obvious, also, that whether hot or cold water is used, the more accentuated the difference between the temperature of the application and that of the body, the more marked will be the effect produced. A most excellent application is that of the abdominal coil, through which water at the desired temperature is kept constantly flowing; a modification of this is that known as the Winternitz method.

Cold applications of all kinds are antiphlogistic and, when prolonged, are sedative. They are indicated in acute gastritis and in the control of vomiting and hematemesis, but, to obtain their full effect, it is necessary that their local action produce an active hyperemia of the skin. (Van Valzah and Nisbet.) Hot applications are most useful in the treatment of gastralgia, hyperesthesia, gastric ulcer and chronic gastritis. The Scottish douche consists in alternately spraying hot and cold water over the epigastrium, and is recommended in the treatment of neurotic conditions. The shower and plunge are employed for their constitutional effects, and in this way will often exert a most beneficial influence upon the local condition.

While it is not contended that the measures here indicated will alone suffice in the treatment of all forms of gastric diseases, much may be accomplished by their judicious employment. We can not ignore the beneficial influences of such agencies as diet, exercise, massage and electricity, not to speak of a few of the more important drugs which are thus used and, in obstinate cases especially, we are not likely to rely wholly upon any one remedy, however valuable. To be successful, hydrotherapy, like all other forms of treatment, will have for its governing factors, an exact diagnosis, a thorough knowledge of the patient, a full understanding of the causative influences, and a clear conception of the effects of the remedial agent. To these must be added the confidence and co-operation of the patient.

NEURASTHENIA AND ITS TREATMENT.

Read before the Mississippi Valley Medical Association, Nashville, Tenn., Oct. 11-16, 1898.

BY H. C. SHARP, M.D.
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Neurasthenia is far from a rare disease. In fact, from the point of frequency, it stands at the head of the list of nervous diseases and is the most important neurosis met with by the general practitioner. This is especially true in America. Beard, who was the first to recognize the importance of this disease, believed it to be limited to this country, and described it as being a condition recognized by a group of symptoms which do not rest upon any distinguishable anatomic basis, and peculiar to America. Later investigation, however, has shown that people of other nations are subject to neurasthenia, although it is by far more prevalent in our own than any other country. In my judgment, this is due to the fact that we expend a greater amount of energy in accomplishing our ends than any other people on the face of the globe.

A business man in our American cities will leave his desk, go to his lunch, and in twenty minutes be found back again at his place of business pondering over some perplexing financial proposition. Never was there a time or place that the "Golden Calf" was worshiped more than it is in America today. The politician is continually wrought up, whether it be that he is stimulated by success or oppressed by defeat, either of which is injurious to health and fav-

orable to the development of neurasthenia. The student or college professor is found with the lamp burning long after midnight, with a total disregard of his physical or mental requirements, and apparently unaware of the energy expended. What, however, is true of the business man, the politician or the student, is true ten times over of our energetic, ambitious American women.

I will digress here to say that the diseases peculiar to women—such as diseases of the ovaries, the uterus, or any other organ of the body—I do not discuss in this paper, but leave them to be treated by those who make a specialty of that particular department of medical or surgical science.

It is my desire to treat only of such cases of neurasthenia in which the cause is traceable to the social, domestic, business or professional condition of the patient. I have already spoken briefly of the two last-named causes; but the chief causes of the neurasthenic condition in women are due to the domestic surroundings and social life of the patient. The average woman feels that her life depends upon her social success. She also feels that her position is very uncertain, that the queen of the hour is at any moment likely to be deposed for a newer and more dashing beauty; that unless she is ever pleasant and pleasing to the eye, she may be entirely forgotten and cast aside without notice, a thing in her judgment justifiable of great grief, sorrow and much worry. With this firmly fixed in her mind, she enters upon her life work with the devotion of the business man, the feeling of uncertainty of the politician and the forgetfulness and disregard of self of the student, which is made up of one continuous round of excitement, pleasure, disappointment and dissipation.

It is only too often that the domestic relation is not as it should be, and where there should never be anything spoken but words of love, sympathy and encouragement, there is nothing but the most sarcastic questioning and replies; the tranquillity and rest of domestic life are to her unknown.

The social queen will lunch at 1 P.M., with an intense headache as her only companion; dress, take a drink of spiritous liquor, or, too frequently, a quarter-grain of morphin; go to her drawing-room to entertain pleasantly those for whom she has no other feeling but hatred or envy, dine at 6 P.M. with a man who is supposed to be her protector, but does and says only that which will annoy and distress her. Afterward, at about 10 o'clock, she goes to a party or reception, there spends an evening of excitement mixed with the usual amount of disappointment, returns home in the morning as the sky begins to grow gray in the East, endeavors without much success to secure a few hours' sleep, rises at 10 A.M. with a feeling of exhaustion, and with burning eyes and intense pains in the head, endeavors to overcome this feeling by the use of stimulants, takes her usual breakfast of coffee and dry toast and starts out to repeat the yesterday of every day of her life. Such a life at breakneck speed is not at all exceptional, and so it comes to pass that those who were once shrewd business men, successful politicians, profound students or bright and interesting women find that they have destroyed their health, and we are confronted with a group of neurasthenics with all the usual symptoms, which are always expressive of chronic fatigue, a burning in the head, associated in many cases by a feeling of mental incapacity, and it is not an unusual thing for such patients to express a fear of losing their minds; they are unable to concentrate their thoughts on anything; to write a letter to a friend or read a book of the lightest order is an impossibility, and frequently they complain of a burning and weakness of the eyes.

A very important symptom, and one that is frequently the cause of the patient importuning a physician for relief, is the inability to sleep. There is usually a marked diminution of nervous energy, also an increased reaction to external impressions. In proportion to diminished resistance to fatigue, there is a diminished resistance to impression from without. Thus it is, that you occasionally find a patient who has been suffering from some pathologic condition for years which was passed unnoticed until the development of the neurasthenic condition. Such patients can not engage in even the most moderate exercise without becoming extremely weary. They are usually irritable, fretful and peevish, the bowels constipated, the skin dry, and the patient complains constantly of cold hands and feet as the result of feeble circulation. Those suffering from this disease are usually very much depressed, and insist that they will never recover their health. But, with all the frankness of physicians, I think we can in many cases promise the patient an ultimate recovery, notwithstanding the fact that many authorities state an opinion to the contrary.

The treatment of these cases depends upon the exciting causes of the condition. If you find that the exciting cause of the trouble is a diseased ovary, the patient is referred to a gynecologist, and is cured of her neurasthenia by the removal of the cause, or if the cause is based upon any other pathologic condition, it is treated in a way prescribed for the special ailment. But when the cause is traceable to the mode of life we have an entirely different and far more difficult task to accomplish.

In the foregoing cases we remove the cause from the patient, but it now devolves upon the physician to remove the patient from the cause, an operation that is not always so easily performed. It is not an easy thing to persuade a man of business to leave his desk, a politician to abandon his campaign, a college professor to resign his chair, or a woman to give up her position in society; but, if we are to meet with success, this is exactly what must be done; not in part, but absolutely, until a radical cure is effected. To do otherwise would be as absurd as to remove but a portion of a diseased tissue. The patient should be given to understand that his condition is a serious one, but not necessarily fatal; he must give up everything and turn his attention to recovering his lost health. He is given absolute rest, both physical and mental; he should be dealt with firmly yet kindly, sympathetically but encouragingly. The rules for the treatment of these cases must be carefully adapted to suit the circumstances of the patient and rigidly followed out. Mental labor must be forbidden and excitement avoided. The patient should be surrounded only with that which is pleasing and soothing. He must be kept constantly under the direction and care of his physician. In my opinion, the physician often makes a mistake in advising patients to go to some fashionable resort for the season, as Atlantic City, Old Point Comfort or some other place of a similar kind, where they obtain no relief, but on the contrary, the demands made upon them are often greater than at home

Such places are fit only for well people, and in no way adapted to the sick.

The diet should be plain and highly nutritious. My preference is to rely chiefly on milk for the nourishment of a patient, but allow him to select anything, such as fruit, fresh vegetables and meat, for the purpose of gratifying the palate. It is well to have a scale handy, where the patients may be frequently weighed, provided they are gaining in flesh, for an increase of weight always encourages them and prevents them from growing despondent or dissatisfied with the treatment. If the patient is poor in flesh it is surprising to find how buoyant he becomes whenever he discovers he has gained a few pounds in flesh.

One of the most frequent complications we encounter is gastric or gastro-intestinal catarrh. This should be treated by a lavage of first hot and then cold water; also warm poultices over the abdomen. This, while simple, is usually very efficacious.

In the treatment of neurasthenia, where the cause is due to the aforesaid condition, and where there are no pathologic conditions of any of the organs, it is very seldom necessary to resort to medicine of any kind. The rest, the withdrawal of the causes that have produced the conditions, and the diet are usually all that is necessary. The patient should never be allowed to return to his former mode of living as long as there is a single abnormal condition, but should be kept strictly under the care of the physician until he is absolutely satisfied that recovery is assured, and if this treatment is carried out until the patient's health is absolutely restored, there is very little danger of the return of the original condition, provided the patient in after-life pursues his business in a moderate way.

SERUM-THERAPY IN TUBERCULOSIS.

BY W. THORNTON PARKER, M.D.

A recent paper by Dr. Robert Reyburn, at the meeting of the AMERICAN MEDICAL ASSOCIATION (vide JOURNAL, Oct. 1, 1898) has attracted my attention as being an excellent illustration of the best thought on this perplexing subject, and I wish to call attention to some points which are particularly useful to remember when we are considering the question of the treatment of tuberculosis. After quoting Hirsch as stating that "about one-seventh of the mortality that exists among civilized men is due to tuberculosis," the inquiry is made: "What are the principles of treatment that should guide the physician in the management of cases of tuberculosis?" That tuberculosis can be cured Dr. Reyburn, with many others, firmly believes. "That these cases are cured is proven by the universally admitted fact that a large proportion of cadavers of persons who have died from many different diseases have, on postmortem examination, shown indubitable evidences of having at varied periods of their lives suffered from tuberculosis of the lungs." Dr. Reyburn also quotes Dr. J. Hughes Bennet as stating that "the spontaneous arrest of tubercle in its early stages occurs in the proportion of from one-third to one-half of all the individuals who die after the age of 40." The observations of Royet and Boudet confirm this statement. "As the larger proportion of these cases never received any medical treatment for their tubercular disease of the lungs, it must be perfectly apparent *that the fluids and tissues of the body* must have the power to destroy and render inert these poisonous micro-organisms. Where does this power reside? Metchnikoff thought he had discovered the answer when he elaborated the doctrine of phagocytosis. Nuttall, Buchner, Nissen, Lubarsch and others have shown conclusively that the power of destroying the bacteria, etc., resides not in the leucocytes, but *in the blood serum*. This preservative power of the blood serum also explains why it is that the human body is able to resist the destructive action of the innumerable poisonous micro-organisms which constantly surround us. There exist, however, two conditions which have a most powerful effect in increasing or diminishing the power of blood serum to destroy these micro-organisms. The first of these is the high or low condition of the health of the individual at the time of receiving the infection. If the individual is in a high state of health, his blood serum is then capable of destroying an immense number of these pathogenic organisms, and he is thus rendered immune to the disease. Dr. Reyburn states that, on applying the lesson to be drawn from the above mentioned facts, "patients with tuberculosis can be cured by being placed under proper conditions of hygiene." We enjoin perfect cleanliness, we direct that they shall receive an abundance of easily assimilated and nourishing food, we send them away from the vitiated, impure air of the city to breathe the pure and reviving air of the country," and then the Doctor returns to the professional track where many of us *can not* follow him, but which is thoroughly up to modern methods of dosing: "We give them cod-liver oil tonics, the preparations of iron, iodin and its compounds, beechwood tar creosote, and now and then a little codein or morphin to allay the cough and produce sleep" and, he adds, "*this* is not a long list," and as medical practice goes he is right. We all know how patients are dosed. Even such men as Sir Andrew Clark, Scoda, Oppolzer, our own Flint, Loomis, Da Costa, leaders and teachers, give their patients prescriptions to be filled at the drug-store. Can *drugs* hinder the march of tuberculosis? A century ago Dr. Benjamin Parker, a successful practitioner in Virginia, taught that medicines in the treatment of consumption were not to be depended upon, and that what we call hygiene, and outdoor treatment in a suitable climate, was the essential means of cure. Modern science has supplied to hygiene serum-therapy.

Dr. Reyburn states, after giving his list of drugs, that "one fact to be noticed is that all the remedies which the experience of ages has taught us to be useful in tuberculosis are *reconstructive* medicines, which tend to build up the body and improve the health." The patient is advised to go "immediately to the seashore or country;" still better, if his means permit it, send him to the great table-lands west of the Mississippi, to New Mexico, etc. He condemns the use of Koch's tuberculin, and concludes his admirable paper as follows: "Another and a very serious objection to the use of tuberculin R for diagnostic purposes arises from the fact that many people have encapsuled tubercular bacteria in the apices of the lungs, which are for the time being harmless. If we inject the tuberculin R and obtain the reaction characteristic of tuberculosis, we may awaken to activity these dormant germs, and thus aid in poisoning the system of our patient instead of promoting a cure of his disease. While wishing heartily, therefore, that the results of the injection of tuberculin R should have aided in destroying the most dreadful disease

that afflicts humanity, yet we feel compelled to say that we have little hope of the cure of tuberculosis by this means." We agree with the last statement most fully, and undoubtedly the question of serum-therapy could not be more vigorously or more righteously disposed of. Our leading manufacturers are supplying quantities of serum to those who believe in the use of immunized serums in general, but I am glad to know that one firm in Detroit, Mich., Messrs. Parke, Davis & Co., are using the facilities their magnificent plant affords to provide free of expense to physicians for experiment, normal non-immunized serum. At the meeting of the AMERICAN MEDICAL ASSOCIATION in Philadelphia, I was, I believe, the first in the country to urge the value of normal non-immunized, horse blood serum as a natural antitoxin, not only in the treatment of tuberculosis but of diphtheria and scarlet fever, and in wasting disease in general. For many years I have contributed articles on the climatic treatment of tuberculosis in Colorado and New Mexico, where I have myself witnessed *many* recoveries, but in recent years I have believed that while climatic treatment is the most desirable, blood serum is a powerful means of cure. The serum with the climatic treatment is my ideal. I have been working for some time to create an interest in what I call the goat cure. A resort where healthy outdoor exercise can be indulged in, either at the seashore or in the Maine or Adirondack forests, or west of the Mississippi, and goat's milk to drink, goat's flesh to eat, and goat's blood either for rectal injection or for drinking, and finally, goat's blood (normal) serum injected subcutaneously and, in some urgent cases, by transfusion. It is along these lines I am working and planning, and I believe that time will demonstrate that this method of cure is worthy of general approval. I have already contributed several papers on this subject, and have others in mind to contribute as soon as possible.

Westboro, Mass.

SPECIFIC ACTION OF AIR IN CONSUMPTION.

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Aerotherapeutics in consumption is not a new treatment, although it has had a varied application. Forcibly holding a full breath with the glottis closed was recommended by so ancient an authority as Hippocrates with the idea that it "opened out the channels of breathing." Galen declared that it "opened out the internal cavities." They were positive, however, that it was the proper treatment for consumption. Their explanation for the practice was based upon the antiquated notion that by this pressure of the muscles air was conveyed through all the arteries of the frame. The most reasonable explanation would be that during the compression of a distended chest, with the glottis closed, air finds its way forcibly into little-used, collapsed or plugged-up alveoli, aerating them more perfectly than in ordinary breathing. Much has been written on the subject of climate and aerotherapeutics, chest development and kindred subjects. Inhalations, full breathing and prolonged expirations to increase the tension, chest exercises, and gymnastic exercises are recommended with great benefit, and all the most successful efforts of physicians against the disease are attained in this line. All are efforts in the right direction, but without sufficient philosophic basis to give a uniform system and uniform results.

It will be shown that if air can be kept in the air-cells, those cells can not become tubercular, as tuberculosis always involves the infiltration of the alveolar wall and the plugging of the cell. If air can thus prevent the tubercular process, or cure it when once begun, then air is the specific for this disease. That this specific action of air against the miliary tubercular inflammation has been amply demonstrated, there can be but little doubt. The well-known and successful treatment of tubercular peritonitis involves only one more important point besides the action of air, and that is drainage, which precedes the admission of air to the peritoneum. The tubercle lies in the superficial layers of the peritoneal membrane, and there is no mixed infection, no suppuration to prevent the action of air on a portion, at least, of the membrane and its tubercles. In tubercular ulceration of the larynx, however, we have the destructive processes of mixed infection infiltrating the deep tissues beyond the reach of air.

At the Medical Congress at Rome there were reported 253 cases of tubercular peritonitis operated on, with 85.4 per cent. of recoveries. It was also pointed out that the failures resulted from the serious complications, which of necessity must result fatally. Roersch's statistics make the percentage somewhat less. Of 358 cases, 253 cases, or 70 per cent., were discharged as cured. This large percentage of cures would almost compel us to acknowledge the specific action of air.

Seganti performs "a pneumatic lavage" with a couple of canulas, drawing out the ascitic fluid and admitting air to the peritoneal sac with success.

Although the miliary tubercle is a new growth, it is not stable, and entirely disappears under proper conditions. These conditions are aseptic drainage and the action of air. I am aware that there are other theories which do not recognize these two points as essential in the care of peritoneal tuberculosis, but I consider them based on unimportant facts, and in the analysis of the treatment those two points are always present and are essential. Now, if these two essentials can be applied in the treatment of pulmonary tuberculosis, we may hope to get similar results.

Asthma is never present in consumption. Attacks of it may occur in acute descending bronchitis, and this condition is often present in the first stage. Emphysema and asthma are notoriously antagonistic to the development of tuberculosis in the lung. Post-mortem examinations of chronic asthmatics frequently show the remains of an old tubercular focus—the consequent alveolar distension due to the asthma curing the tubercular disease, or at least rendering it dormant. Air has been brought into direct contact with the tubercular alveolar wall by the emphysematous tendency of asthma.

It has been long known that pulmonary hemorrhage in tubercular phthisis is usually followed by improvement, and the prognosis in the same class of cases is usually very good as to length of life. It seems to me that the proper explanation for this is that the hemorrhage so reduces the congestion of the cell walls that air is more effectually drawn into the alveoli by ordinary breathing, when its beneficial action can be exerted on the inflammation, for a time at least.

Regarding etiology, I believe tubercular phthisis is a disease of inactivity in the majority of cases,

inactivity or non-use of certain areas of lung tissue, due probably to the weight of the arms and shoulders on the upper chest, together with an insufficient amount of physical activity to aerate the whole lung. Malformation of the chest might be mentioned, but that could be overcome by physical activity and development. Certain alveoli in this area of least activity become congested or entirely occluded by catarrhal products. Soon the ever-present tubercle bacillus enters upon the scene of action and determines the character of the inflammation, until the germs of suppuration assist in the work of destruction.

Hanau states that the apex of the lungs becomes the seat of the tubercular infiltration as the direct result of insufficient ventilation. This explanation is generally received as true, but it has not been studied or considered as a basis for therapeutics.

The existence of the miliary tubercle is not a bar to recovery in peritoneal tuberculosis, and their appearance in lung tissue should be no greater obstacle. Just how aseptic drainage and aeration bring about the favorable results can only be conjectured. Necessarily germs and their toxins are carried out with the exudate, circulation is facilitated and stimulated, nutrition improved, phagocytosis encouraged, and possibly antitoxins formed which aid in restoring health to the inflamed tissues.

Aseptic drainage and ventilation of the alveolus are possible from the elastic nature of the lung parenchyma, and as long as the cell wall is intact air may be forced into it, distending it, and gradually forcing out the gelatinous and albuminous plug with every expiratory effort, or contraction on the confined air behind the plug. That our efforts are successful may be known from the general improvement of the patient, the diminishing area of dulness, the smaller amount of expectoration, the longer wind power and slower pulse of the patient. The increased lung capacity and relief from the shortness of breath is often immediate and surprising. It will not be sufficient to simply have the patient sit out of doors and breathe the outside air, or walk and take gentle exercise, or even pulmonary gymnastics and full breathing, all of which are good. In that treatment we recognize only that air is a good thing, and in some mysterious way improves the general nutrition and condition of the patient. But now base the treatment on the specific action of air on the tubercle, and it will be conceded that the air must be brought into direct contact with it, and any treatment or method which does not recognize that fact and force the air into the alveoli, will fail to give the certain results expected from a specific. The method I use was described in an article which appeared in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, May 4, 1895, entitled "Forcible Alveolar Expansion in the Treatment of Consumption." I direct the patient to take as full an inspiration as possible, then closing the glottis and bearing down just as if straining at stool for a few seconds, so as to increase the tension of the air in the upper chest. In performing the act in that manner the greater effort is expended in the muscles of the abdomen, and consequently the air is forced upward.

A method frequently recommended, of blowing through a small tube in order to increase depth of the respirations, defeats its own purpose, because in the effort of blowing, the expiratory muscles of the chest are brought more strongly into action, compressing equally over the chest, but not in any particular direction, the air being driven out without any alveolar expansion.

The exercise should be practiced frequently so as to keep up a constant effect in the infiltrated area. Five to fifteen minutes every two hours during the waking hours, and frequently at night if awake and coughing. The effect is increased if during the holding of the breath the lower chest is compressed with the hands, which also lifts the weight of the arms and shoulders off the chest. It is not the length of time the breath is held, but the tension developed in a few seconds, from which the benefit is derived. This is the simplest and easiest manner of holding the breath, and may be practiced without attracting the attention of anyone; still, it is difficult for some patients to learn and establish the habit so as to continue it regularly. It will require some practice in order to get the best results, but an ambitious patient will usually pick it up very quickly.

In order to increase the interest in the treatment, a nebulizer should be given the patient, and the importance of getting the antiseptic nebula well down into the air-cells by the method described above impressed upon him. The nebula will, of course, assist in relieving the bronchial catarrh so common and troublesome. Massage of the chest by manual compression of the lower chest during the holding of the full breath, I often practice as part of an office treatment with a multinebulizer. The tension developed in the lung should not be too high at first, but may be quite rapidly increased, especially when there is no pain or hemoptysis. Neither pain nor hemoptysis are contraindications to the treatment, as they both disappear in a short time. I usually practice the massage at the office every day, or every other day. If the glottis is not closed in this act of holding the breath, air is drawn into the lungs, but there is no tension developed, and it is simply an inspiratory exercise, and fails to accomplish the end desired, because it does not forcibly dilate the alveoli. Active exercise producing rapid respiratory efforts in cases not too far advanced will go far toward carrying the air into the alveoli.

The immediate results will be an increased amount of oxygen in the blood, a strengthened heart's action and facilitated expectoration. Thorough inflation of the chest always gives great relief from shortness of breath. The effect of the alternate expansion and contraction of the chest is to force out the contents of the alveoli into the bronchioles, then into the larger tubes until they are expectorated. This is drainage and makes ventilation possible; each alveolus thus ventilated is soon restored to health by the action of the air on the miliary tubercle in the cell wall. The area of consolidation is gradually reduced, and infiltration clears up. Expectoration is gradually reduced in amount. The general improvement and well-feeling of the patient is soon very manifest.

I am not sure that the treatment is of much benefit in rapid cases, although it does make breathing much easier, and facilitates expectoration. However, if it be applied energetically with the use of oxygen gas, good results may be obtained. Over-distension of the alveolus is hardly possible, and emphysema no more serious than might occur from violent straining at stool in constipation, or from the expulsive pains of child-birth. I do not know of any serious contraindications to the treatment. One might expect hemorrhage to be increased from the increased activity to

First stage cases.

No.	Case.	Age.	Weight.	Temp.	Pulse.	Night sweat.	Expectoration.	Examination of lungs.	Basis of Diagnosis.	Result.
1	Miss N. J.	17	124	100–102	120	Yes	Scanty.	Slight infiltration of right apex	Bacilli.	Recovered.
2	Mr. E. G.	30	165	99	90	No.	Considerable.	Slight infiltration of right apex	Tuberc. reaction	Recovered.
3	Miss C. C.	18	110	99.5	88	No.	Scanty	Slight infiltration of right apex	Tuberc. reaction	Recovered.
4	Mr. G. W.	40	162	99.5	96	No.	Scanty, but severe cough.	Slight infiltration of left apex	Tubere. reaction	Recovered.
5	Mrs. B. G. O.	35	122	99.5	95	No.	Scanty.	Slight infiltration of right apex	Bacilli.	Recovered.
6	Mr. J. I. C.	38	130	99.8	95	No.	Scanty, cough severe	Slight infiltration of left apex	Tubere. reaction	Recovered.
7	Mr. W. S.	24	126	99	85	No.	Scanty, cough severe.	Negative.	Tubere. reaction	Recovered.
8	Miss M. F.	17	..	102.5	101–110	No.	Scanty.	Not given	Tubere. reaction	Recovered.
9	Mr. R. F.	34	..	99	80–90	No.	Scanty and cough.	Not given	Symptoms	Recovered.
10	Miss A. P.	21	..	101	90–115	No.	Cough severe.	Not given	Tuberculin test.	Recovered.

Second stage cases.

1	Mr. A. A. P.	32	110	99.5	95	Occasional.	Thick, purulent	Left lower lobe consolidated.	Foll'w'g pneumonia	Recovered.
2	Mrs. M. B.	50	115	99.5	80	Occasional.	Thick, purulent	Left lower lobe consolidated.	Foll'w'g pneumonia	Recovered.
3	Miss M. K.	28	137	100	98	Frequent.	Thick, purulent	Right upper lobe consolidated.	Bacilli and reaction	Improved.
4	Mr. J. E. J.	32	149	101	95	Frequent.	Thick, purulent, mornings.	Left upper lobe consolidated.	Bacilli and reaction	Recovered.
5	Mr. J. F. B.	29	140	100	90	Occasional.	Thick, purulent, mornings.	Right upper lobe consolidated	Bacilli and reaction	Recovered
6	Mr. W. B. E.	27	118	101	108	Frequent.	Thick, purulent	Right upper lobe consolidated, complicated with intestinal tuberc.	Bacilli and reaction	Died.
7	Mrs. F. C. F.	21	101	101.5	100	Frequent.	Thick, purulent, mornings.	Left lower lobe consolidated from pneumonia	Bacilli, numerous.	Improved.
8	Miss S. P.	29	114	101.3	120	Frequent.	Thick, purulent, mornings.	Most of left upper lobe consolidated	Bacilli, few	Improved.
9	Mr. R. M. H.	25	142	99.5	85	Frequent.	Thick, purulent	Right upper lobe consolidated, complicated with intestinal tuberc.	Bacilli, numerous.	Died.
10	Mr. P. B.	42	145	99	90	Occasional.	Thick, purulent, bloody	Left upper lobe hemorrhagic.	Bacilli, numerous.	Recovered.
11	Miss I. M.	24	95	101	120	Occasional.	Thick, purulent, mornings.	Left upper lobe hemorrhagic.	Bcilli, few	Improved.
12	Miss L. M.	34	134	99.5	80	Occasional.	Thick, purulent, mornings.	Left upper lobe; ulcer of larynx	Bacilli, numerous.	Improved.
13	Mr. C. L.	35	130	100	84	Occasional.	Thick, purulent, mornings.	Right apex; ulcer of larynx.	Bacilli, numerous.	Recovered.
14	Mr. F. G.	28	165	101.5	96	Occasional.	Thick, purulent, mornings.	Right apex consolidated	Bacilli, numerous.	Recovered.
15	Mr. W. H. S.	27	126	102.5	105	Occasional.	Thick, purul., cough severe.	Left upper lobe consolidated.	Few bacilli	Recovered.
16	Mrs. A. H.	36	112	101.5	96	Occasional.	Scanty.	Right lower lobe consolidated	Tuberc. reaction	Improved.
17	Mr. A. B.	34	114	100.6	96	Occasional.	Scanty.	Right apex consolidated	Bacilli, numerous.	Recovered.
18	Mr. E. S.	31	115	101	120	Occasional.	Abundant, thick	Rt. lung almost entirely consolidated; infiltrated or ulcer of larynx	Bacilli, numerous.	Improved.

Second Stage Cases.—Dr. Salter's

19	Miss N. H.	20	112	102	115	Yes	Considerable.	Consolidation of right apex.	Bacilli.	Recovered.
20	Miss E. H.	24	102	103	110–134	Yes	Moderate.	Consolidation of left upper lobe	Bacilli.	Recovered.
21	Miss L. B.	19	105	97–104.5	90–100	Yes	Heavy, purulent; at times bloody.	Consolidation of right upper lobe.	Hemoptysis bacilli.	Recovered.

Third Stage.

No.	Case.	Age.	Weight.	Temp.	Pulse.	Night sweats.	Expectoration.	Complication.	Examination of lungs.	Basis of diagnosis.	Result.
1	Miss J. S. G.	45	108	99.7	96	Occasional	Abundant and purulent		Consolidation of left upper lobe and part of right.	Numerous bacilli.	Improved.
2	Miss M. McF.	19	112	97–101.5	130	Frequent.	Considerable.	Prof'nd anemia.	Cavity in left upper lobe.	Few bacilli	Improved temporarily.
3	Mr. H. C.	20	100	97–105	116	Frequent.	Thick, heavy, purulent.		Cavity in right upper lobe.	Numerous bacilli.	Died.
4	Mr. N. D.	27	116	102	136	Frequent.	Thick, heavy, purulent.		Cavity in right upper lobe	Numerous bacilli.	Died.
5	Mr. F. R. H.	45	135	103.4	110	Frequent.	Thick, heavy, purulent.	Extensive ulcer of larynx	Cavity in left upper lobe, consolidation right apex.	Numerous bacilli.	Improved; died.
6	Mr. A. P.	25	98	103.5	126	Profuse	Thick, heavy, purulent.		Cavities in both up. lobes.	Numerous bacilli.	Improved; died.
7	Mr. C. C.	22	105	101	110	Occasional	Thick, heavy, purulent.	Extensive ulcer of larynx	Cavity in left lung	Numerous bacilli.	Improved; died.
8	Mr. T. N.	19	110	99	115	Occasional	Thick, heavy, purulent.		Cavity in left lung.	Numerous bacilli.	Improved; died.
9	Miss M. S.	27	94	103	120–130	Frequent.	Abundant.		Cavity in left lung.	Numerous bacilli.	Died.

which the lung is put, but, as a matter of fact, I have had the very best results in hemorrhagic cases, in some cases the hemorrhages disappearing in a few days, never to return. The existence of cavities seems to be no contraindication, although necessarily that class of cases will not respond to the treatment very rapidly. Pleurisy, if quite general, may be aggravated by the extensive chest movements and the pain be considerable for a time, until the tubercular inflammation under the pleura has subsided. In one of my early cases there were friction murmurs over the whole chest, and the exercise was most painful for several months, but by persisting in it improvement came and ultimately complete recovery.

The method I have advocated might be termed "auto-pneumatic differentiation." It has the advantage that the patient is continually under its influence while practicing it. Tubercle bacilli can never attack normal lung tissue in active use, consequently I promise my patients that so long as they make active and forcible use of their lungs, there is not the slightest danger of relapse or contracting the disease anew. Unless a case is far advanced in the third stage, or is of the rapid sort of phthisis, it is hardly possible for the disease to make any progress in the lung tissues if the treatment is carried out conscientiously. And I believe that every uncomplicated case taken short of the stage of ulceration and mixed infection, will be found curable. As supplementary measures in the management of the disease are also very necessary, some important ones may be mentioned: the recumbent position during high fever in the afternoon; light meals during fever. To overcome the muscular atrophy about the chest, any gymnastic exercises will be of benefit provided they do not fatigue. Appropriate medication should be directed toward improving the digestion, but the routine tonics may as well be omitted if they do not positively improve the condition of the stomach. The rapidity of improvement will depend greatly on the extent of the consolidation and the inroads the disease has made in the constitution of the patient, as well as the zeal with which the patient carries out the treatment.

With regard to climate, a patient certainly stands a better chance of recovery at home, with the comforts of a home, if he has correct treatment, than if he went

to another climate, depending upon the climate alone for his cure, as is usually the case. Altitude has cured a large number of cases; the cure, however, rather coming from the increased activity to which the lung is put as one goes to a higher altitude. That benefit is doubtful if the patient remains indoors in a hotel, or is unable to be out of doors. When all first-stage cases and over half of the second-stage cases can be cured at home, there is little to be gained in sending them to another climate without treatment.

It will soon be admitted that tuberculosis of the lungs in the early stages is the most curable of any of the chronic diseases, and in the last stage it is about the most hopeless of any, consequently we must consider the early diagnosis of the disease the most important point in its management next to correct treatment. It is simply criminal to make a false diagnosis and waste time with remedies which do little but interfere with digestion, until the case has advanced to the last stages, and then advise to change climate.

Of the 16 cases reported in my first paper, 15 were cured, and one died of pneumonia. Nine were first-stage cases and 7 were second-stage cases. Since that time 3 of the 15 have died—one of consumption developed the following winter from severe exposure, one of acute meningitis, and one from typhoid fever. The remainder are all in good health. Since that report I have treated 34 cases on the basis of the specific action of air, with equally good results in the same classes, although a portion of the cases coming to me have been of the more advanced and complicated sort. Included in this report are three first-stage cases and three second-stage cases, reported by my friend, Dr. Allen Salter of Lena, Ill., having practiced the same line of treatment.

Ten first-stage cases were all cured; 21 second-stage cases, 12 were cured, 7 improved and 2 died; 9 third-stage cases, 8 died, some of whom improved temporarily, one being greatly improved for over a year, since which time I have had no report.

Summarizing all the 56 cases we have: 19 first-stage cases cured; 28 second-stage cases, 16 cured, 7 improved, 3 died; in 9 third-stage cases, no cures, 6 improved temporarily. Leaving out of consideration the third-stage cases, for whom we can not hope to do much with any treatment, there are 47 cases, of which 37 were cured, or almost 80 per cent., or 66 per cent. of all the cases.

SOCIETY PROCEEDINGS.

New Jersey Sanitary Association.

Twenty-fourth Annual Meeting, held at Lakewood, Dec. 9, 1898.

Dr. W. B. JOHNSON of Paterson presented the first paper, entitled

DEFECTIVE VISION IN SCHOOL CHILDREN.

It was not the purpose of the paper to prove by a series of statistics the presence of defective vision in school children and that these are the result of the unsanitary condition of school buildings, or the methods which have dominated our educational system from its inception. A change is now necessary, not only in the construction of buildings, but also in educational systems. Over a quarter of a million children have been examined by various observers, showing a high percentage of increase in these troubles and especially in the more populous centers. We have improper sites and overcrowded buildings. Great benefit, however, has resulted from these examinations by the improved sanitary conditions and methods. In future this will be still greater. Defective vision is the result of ocular conditions affecting the refraction of the eye, caused by structural changes in the eyeball, which is the formative stage when these tissues are most susceptible of alteration in their contour, and accompanying errors of refraction are the result of continued visual effort overtaxing the muscles and tunics of the eye. Infants have, as a normal ocular condition, a hypermetropia or far sight, almost invariably, and it has been shown that the ball undergoes during school life a change and lengthening of the optic axis. Hence we have emmetropia or the normal condition in childhood, and finally, in many cases developing progressive myopia or some form of simple or compound astigmatism. These changes progress during the natural increase of the eye while the structure is still yielding. This is encouraged by the hyperemia of the globe produced by extra visual effort at this period. If this is regular and progressive it only results in myopia or lengthening of the optic axis. If irregular, astigmatism is produced. What can be done for the relief and prevention of these defects is now the question. Public sentiment should be educated to a reform. The State Board of Education and other bodies have interested themselves and furnished drawings of school buildings, for future benefit in this direction. Many ophthalmologists have formulated plans for this purpose, and circulars for the examination of the eyes of school children have been presented both by municipalities and independent observers. The dissemination of the knowledge thus obtained has resulted in many valuable plans for proper sites for schoolhouses, dimensions, arrangements of seats, desks, etc., so that there would be good light, ample capacity, heating and ventilation. It is the hope and belief that in the near future schools will be built only under restrictions which will compel compliance with certain forms and rules for sanitary construction. It is essential for the well-being of all students that the present and the future systematic examination of students be continued and universally adopted. All municipalities should unite in this matter. The New York State Board of Health have issued circulars of instruction for this work. Not only should all be examined, but this should be contiuued from grade to grade to learn whether there is a continued advance in the errors in each case. Errors of refraction should be corrected by glasses, diseased conditions treated, etc. Thus we would have a minimum amount of danger or any increase of ocular defects prevented. The most acceptable method of procedure is to have all students immediately examined by the family physician and when necessary referred to a competent ophthalmologist. When the eye is reddened or we have discharges, the student should not resume work until a medical certificate is given that it is fully proper, and that there is no danger of infection of others. Blank forms of notification should be prepared for the use of teachers and physicians. In all instances there should be a preliminary examination prior to the entrance of a pupil, both physical and ocular. About one-fifth of the population are destined to pass at least one-third of their natural lives, two-thirds of the working hours, at school. Hence the importance of knowing the physical adabtability of each for the work before they are admitted. Scientific advances will soon necessitate the assignment of a student with such defects to a privileged class, where by selective studies, we may enable him to acquire a knowledge commensurate with his educational qualifications, and thus he will be given only that work which he is able to perform, not being advanced till he can do it with safety, nor do work which is more than his strength will allow. One curriculum is not suitable for all, or they will be overtaxed. Teaching should be didactic, with every means to enable the pupil to use the eyes at the distance of the blackboard, thus resting them from close application at the desk. Home work must be lessened, for this is often as bad as at school. A physician should be employed to superintend and inspect the buildings as to heating, lighting, ventilation, cleanliness, etc. There should be an instructor in hygiene for teachers and pupils. This plan was first tried in Germany and was found a success. In the United States there have been only spasmodic efforts in this line. General legislation must come to our aid and make these plans compulsory and thus ensure scientific protection for everyone. Our great advance as a country has been due to the enlightenment of our people. The educational standard has been advanced, and it is of vital importance that attention should be given to every detail in school work that can promote the mental and physical good and prevent degeneration in either of these. Unless the present generation is to nurture a race of mental giants in pigmy forms, steps must be taken at once in the line of preventing diseased conditions or any chance of any character in the children of our public schools.

Dr. G. T. WELCH of Passaic—We will have to demonstrate over and over again the evils attending upon unsanitary and inefficient building sites for our schools. We shall have to declaim again and again against badly constructed and illy

lighted houses, and we shall have to present carefully evolved statistics of the devastation these have wrought upon the eyesight and the general health of students before we make headway with the masses and educate public sentiment aright. We must take into consideration that the hygiene of the schools is a comparatively recent study, and to interest the unscientific mind we must go carefully over the ground that has become so familiar to us, and present the discoveries and conclusions of observers, both at home and abroad, in as familiar and practical a manner as we can command. Simplicity of statement, such as has been given by Dr. Johnson, goes a long way to hold the attention of the popular mind. To properly appreciate the destructive tendencies of city school life on the eyesight and general health of children, it must be borne in mind that near sight is unknown among savages or illiterate people; and is rare among country children, where the schoolhouses are of one room, lighted on both sides, with acres of open ground around them. Vision for distance is almost the only sight required by the savage, but with us the constant demands for civilization always at tension, keep us poring over near-by objects almost exclusively. But where eyes are constantly abused, turned for hours on fine print in dim rooms, with insufficient cubic space, the lungs inhaling vitiated air, the spine bent over badly contrived furniture, an unhealthy condition of the body unerringly results, and a slight degree of hypermetropia deepens into a permanently disabling affection. In the public schools of Passaic we found a large percentage of pupils complaining of headache, many who were unable to keep up with class averages, and something vaguely at fault, which determined us to have the eyes of the children scientifically examined, to find if the most of the evil did not lie in the abuse of these important organs; 2173 of the school children of that year were thus examined; 1529 showed a normal refraction, while 654 had hyperopic and myopic astigmatism. In other words, 30 per cent. were found to be suffering from diseases of the eyes. A record was kept, with the name of every pupil suffering from headache, blurring, pain on studying at night, nearsightedness, defective color perception, or of local conditions requiring medical treatment. Proper circulars were printed, detailing the conditions of each of these affected pupils, and giving plain, concise and necessary directions for their assistance. These were sent under seal to the parents and guardians, and everthing was done to assist every child to obtain the facilities for deriving the utmost advantage from the teachings of the schools. Finally, with great care and immense labor, the mass of information gathered from these examinations was digested and published in an octavo pamphlet of twenty pages and sent to the heads of families throughout the city. The work bore fruit, and will hereafter have its effect on school life of Passaic. Better buildings have been erected since on ampler rooms, better lighted and with greater cubic air-space to each pupil, more satisfactory toilet and sanitary arrangements and many minor improvements. The parents have looked more carefully after the eye conditions of their children, and it has become customary to furnish them early with proper glasses when needed. We organized a State association of school boards, in which the cities joined us in preparing the germs of necessary legislation for the benefit of our public schools. We were not warmly assisted by the State Board of Education, but we persisted in our efforts. We prepared a bill to go before the legislature prohibiting Boards of Education from erecting school buildings on any plot of ground that did not admit of fifty feet in the clear on all sides of the building, and stipulating that the classrooms should afford 250 cubic feet of air to each student. Senators who were approached in the interest of the bill listened to our arguments and acknowledged the justness of its intent. Some promised their support; others pointed out the costliness of city lots—we pointed out the costliness of human eyes. At length it was agreed that the bill should be offered and that we should be given a hearing on its merits. We never heard of it afterward. It died where so many embryos have shuddered and expired—in the hands of an unsympathizing committee. We did succeed in engineering the passage of other laws for the future welfare of schools, but in the particular instance above we did not succeed and the Association finally disbanded. Without doubt this Association should have continued to exist, and its efforts from year to year must have resulted in influencing valuable legislation. Certainly an organized movement of some kind has got to be made if we are to achieve anything besides spasmodic successes along the line. We must arrange for the authority from the State to enforce the best rules that scientific men can devise for the preservation of the health, and especially of the eyesight of the school children.

Each great organized body like the State Board of Health and the State Board of Education strains its prerogative probably as far as it dares for the public good. To do more it must have the sanction of the popular will behind it. In a democracy, even the statesman feels his way carefully along the edge of public opinion before he ventures upon great reformatory measures. He desires to avoid irritating the sovereignty that is not yet prepared for change, and he very skillfully educates it up to the level of his purpose. I think we shall have to do the same with this question. I doubt whether either of these great public bodies aforesaid would feel in a position to advocate successfully the needed law to preserve the health and eyesight of school children, unless public sentiment had been educated to the point of accepting it. On the other hand, I am convinced that the New Jersey Sanitary Association could prove the educator. The agitation of this subject through them and the publishing of such papers as that of Dr. Johnson and all such others as are pertinent to the subject, especially from observers in our State, and the distribution of them to school boards and the public would finally create a healthy opinion that would demand a comprehensive legislation.

Mr. OWEN said that there was no provision for supervision and legislation in the matter, hence very little progress has been made. We must hope for better results by continual agitation.

Dr. MITCHELL of the State Board of Health said that there was an act of the legislature relative to purulent ophthalmia, but while much was expected, yet it failed to effect its purpose and the subject was again brought up, but for want of a penalty to enforce it, it broke down. The Board require all cases reported in practice, yet we know how successfully by the results. Local authorities in examining school buildings and students in order to prevent disease have made very little advance.

Owing to the illness of Rudolph Hering, C. E., of New York, a paper which was to have been read on the subject of "Sewage Disposal" was postponed.

The presiding officer read a paper entitled "Relations of Public Schools to the Health of the People."

Prof. EDWARD B. VOORHEES, M.A., New Brunswick, read a paper entitled

MILK; IS LAW A SUFFICIENT PROTECTION AGAINST IMPURE PRODUCTS?

A careful examination of the statutes relative to the sale of milk leads us to the conclusion that so far as laws are concerned, their enforcement would be ample protection by preventing the sale of impure products, as defined at the time the laws were made; in fact, the impression was that they covered so much ground that the enforcement would be difficult. Nothing appeared to have escaped in the framing of the law. The meaning of adulterated milk was fully defined. Also in an act to prevent the adulteration of food and drugs, milk was also inserted. Under the law consumers may be protected provided the authorities are sufficiently interested, and are capable of properly defining impure milk and of formulating rules and regulations for the guidance of inspectors. Now, is the enforcement of these laws practicable under present conditions? It would seem that the intent of the act was to protect against adulteration by the addition of water or other substances, as fat. It is a well known fact that a chemic analysis is only able to indicate that adulteration is caused by addition to the milk of material poorer in solid matter than milk or by subtraction of any of its constituent food compounds. It will not show whether the milk is from animals improperly housed and fed or suffering with tuberculosis or other diseases; or, if it has come in contact with emanations, discharges, etc., from persons ill with contagious disease. Here the bacteriologist is needed; even he is not always positive. Practical methods have not been devised to show a rapid and positive identification of tubercle except in large number. Hence we may conclude the primary intent was only to protect from inferior standards of milk. It has little to do with the public health. Insufficient appropriation has been granted to permit of the identification of disease in the milk. The writer believes that it would be impossible by any legislation to provide for detection of all impurity and dangers, and thus fully protect the people from them. There is a reasonable doubt of much being accomplished unless by the aid of an enlightened public sentiment, in order to the proper observation of sanitary laws. There is a prevailing ignorance as to many things connected with milk. Yet it is much demanded. There should be the most rigid examination of the animals, the barn, the handling, etc. No doubt there exist in this State herds of cows that are not kept in proper condition, yet the milk from them is sold in the markets. We need a law to enable us to examine into all these points, before we can make sure of pure

milk. If laws were made broad enough to protect against the adulterations and impurities mentioned, and to require proper sanitation in housing, feeding, handling of the product, etc., they would be regarded as ridiculous and farcical under the present state of public knowledge You might arrest the culprit, but to convict him would be the trouble. Yet this is a very serious matter. Law must go in hand with education; all must be taught the elementary principles of sanitary science, to realize the dangers, and the necessity of care and cleanliness in every step. Thus educated, the two classes will exert a co-operative influence for better methods. The consumer must learn that to secure a pure article, he must be willing to pay a good price. Impure and unwholesome matters are cheaper, and people prefer them on that account. All sorts of adulterations are rife in the land, but the greed for cheapness causes this. The question is not "how good," but "how cheap." I can present records as to the cost of sanitary milk. The average of ten years shows that thoroughly sanitary milk costs two and a half cents a quart for food and care. If this milk is sold at the barn for this price, the consumer would be out, as he would receive no pay for his labor nor profit on his investment. Yet the bulk sold from this State does not average this amount a quart; hence, if any profit accrues it must be from the lessened cost of production. There is no incentive to improve quality, but a constant temptation to the honest man to fail in recognizing many things which contribute to unwholesomeness. The aim is to sell milk, not to guarantee purity and quality. The remedy lies in the demand for these matters from the consumer. Another thing which encourages adulteration or watering is the present method of sale on the quart basis, which assumes that milk is milk. One quart is not as good as another. So long as this continues, poor milk will be produced. It may seem that under all these difficulties there is not much hope for the future. But there is a bright side; the germs of knowledge have been introduced—friendly bacteria which are multiplying and producing good results. There is beginning to be a right understanding; consumers are ready to accept instruction and there are those who are ready to serve these with milk of a high quality, absolutely healthful. Small beginnings have been built up into large trades by these. They find it pays them to do well. Both sides are learning, the one as to health, the other as to the pocketbook. This must be encouraged and the whole milk business placed upon a proper basis. Money would be wisely expended in educating the people and in the pursuit of scientific investigation concerning the real, not the supposed, danger to public health from the use of impure and adulterated milk; the results would be the making of simple laws, easy to execute, because supported by public sentiment, and which would fully protect both the producer and consumer.

The association adjourned to meet next November at Atlantic City. Dr. Daniel Strock was elected president for the ensuing year. The other officers are: Jas. A. Exton, Arlington, secretary; Geo. P. Olcott, C. E., East Orange, treasurer.

SELECTIONS.

Successful Removal of Cerebral Tumor.—Oliver and Williamson (*British Medical Journal*, Nov. 26, 1898, p. 1607), report two interesting cases of brain tumor, in each of which the growth was removed and relief afforded. The one case occurred in a boilermaker, 34 years old, who had complained of headache for two years, with loss of power in the left hand and rigidity of the left leg of ten weeks' duration. The headache was worse in the morning, and there had frequently been vertigo. Eleven weeks before coming under observation, the man, falling in a giddy seizure, struck his head against an angle-iron, without breaking the scalp. He arose, walked about a little, became faint and sat down, shortly afterward losing consciousness and not regaining it for three days. At the end of this time he found that he could not move his left arm and hand, and that the left leg was rather powerless. In a few days the paralysis gradually disappeared, but four weeks after the accident vomiting set in, and with it paralysis of the left arm and rigidity of the left leg. For between two and three years there had been a peculiar pricking, "like pins and needles," in the left hand, extending up the arm, the member itself being the seat of a sensation as of hot water running down it, and occasionally shaking. There was bilateral optic neuritis. In addition to the weakness of the left leg and hand, there was the slightest paralysis of the lower half of the left side of the face. The knee-jerk was exaggerated, with well-marked ankle-clonus on the left. A history of gonorrhea was admitted, but none of syphilis. Potassium iodid and mercuric chlorid were tried without benefit. In the course of two weeks the patient complained of feeling drowsy and of severe pain in the head, and shortly afterward he vomited. After a little while he had a convulsion, lasting about three minutes, without loss of consciousness, and involving the left arm, the left leg and the left side of the face. In the course of eight days the loss of power had increased, and there was analgesia and anesthesia of the left arm and forearm, with slighter loss of sensation in the leg. The muscles of the left arm and leg now began to exhibit signs of atrophy, and the reflexes became even more exaggerated. Painful, cramplike sensations recurred in the left hand and forearm, and there was increasing anesthesia. There was no pain on percussion of the skull. Operation was advised, and after some delay was acceded to. An opening in the skull over the Rolandic area disclosed a tumor on the surface of the brain. This was cut out with the handle of a scalpel and was rather larger than half of a Tangerine orange. The wound healed without complication. The tumor proved to be a small round-celled sarcoma. The patient made an uninterrupted recovery, although he subsequently had a single convulsive attack.

The second case occurred in an unmarried domestic servant, 23 years old, who presented partial paralysis of the right leg and complete paralysis of the right arm. Five months earlier the patient had begun to suffer from headache and vomiting. The latter was pronounced in the morning before breakfast, and gradually disappeared during the day; the headache persisted and was generally frontal. After nearly two months numbness appeared in the right arm and hand, and in a day all power of movement in the arm was lost, the fingers being flexed in the palm of the hand. Some two weeks later a slight convulsion occurred, with loss of consciousness lasting nearly an hour. Subsequently the right leg was also paralyzed and numb. Slight analgesia was found upon the right leg, and the knee-jerk was increased. There was slight paralysis of the lower half of the right side of the face, and the tongue was deflected a little to the right. The expression was dull and heavy. There was complaint of pain in front of and above the left ear when the skull was tapped. Bilateral optic neuritis in the first stage was present, with tortuous vessels, but without retinal hemorrhages. The symptoms suggesting a tumor on the lower portion of the left motor area of the brain, the skull was opened, and the growth, together with a narrow margin of healthy-looking brain tissue, was removed. There was subsequently some aphemia and right-sided weakness, both of which grew progressively less. Histologic examination showed the growth to be an angioma.

Treatment of Raynaud's Disease.—Dr. H. E. Randall has reported (*Medical Age*, Nov. 25, 1898), an interesting case of this disease in a male aged 52 years. The patient was of unusual intelligence, the picture of health in his face, but quite helpless, owing to the ravages of the disease. The right leg had been amputated four inches below the knee and the left leg above the knee. Up to six years ago, when the disease first came on, he was as healthy as a man can be. He had never been sick a day in his life, except a few bilious attacks, and said he did not know what headaches were. His family was of a very robust type. One grandfather died at 93 years, of cancer, and the patient's brother is said to have died of cancer of the bladder. Otherwise family history is good. The affection first made itself known in 1892, when, with severe paroxysms of pain, a small red blotch appeared on the instep of left foot, and this was followed by others of like character on the calf of the leg. About this time he noticed a peculiar cracking or

ticking sensation in his head just back of the ears, across the base of the brain. These red blotches on the leg would come and go, but in a short time the entire leg below the knee became swollen and blue, and just underneath the skin were several nodules varying in size from a hickory-nut to a hen's egg. The large toe now became gangrenous, and in January, 1895, the leg was amputated above the knee. The right leg passed through a little different course. The leg became swollen from the knee downward and serum exuded through the skin of the foot, which peeled off. The third toe now became gangrenous, and in the following April, four months after the operation on the left leg, the right leg was amputed four inches below the knee. Following this the patient had relief for a couple of years, when both hands became red and swollen. Last spring he was confined to bed for several weeks with the pain. In May both hands and arms were very red and swollen almost to the elbow. Black or blue spots would appear upon the fingers and disappear again. Small nodules formed in the arms and would disappear in two or three days. The patient has been in very competent hands, and a great variety of drugs has been tried. He had been saturated with mercury, iodid of potassium, tonics of all kinds, alteratives, digitalis, strychnin, etc. Thinking that nitroglycerin was indicated by the hard and rather slower than normal pulse, he was placed on that drug, although his face was red and flushed. This, with massage, has been the main treatment. The massage alone will at times relieve the pain, but as this was not sufficient, a solution of two grains of morphin in two ounces of the tincture of opium was applied locally, which controlled the pain. These paroxysms of pain have been so severe as to keep him awake until late in the morning, when he would catch a couple of hours' sleep. The prognosis of Raynaud's disease is unmitigatedly bad, and it is probable that the patient will lose his upper extremities as he has his lower. Wide-spread gangrene in Raynaud's disease is uncommon, and only superficial portions slough off after the epidermis is raised up into the blebs, which rupture, leaving a dry surface. When gangrene threatens, the hand should be wrapped in flannel or cotton-wool, and when it occurs dress antiseptically until a line of demarcation forms, when dead parts may be removed by scissors, forceps, or antiseptic poultices. Nitroglycerin with massage alleviates the pain and keeps the patient moderately comfortable.

PRAGTICAL NOTES.

Neuralgia of the Trigeminus.—J. Hirschkron recommends three cachets a day of the following: Extract of cannabis indica .50 gm., salicylic acid 5 gm. For ten cachets.—*Semaine Méd.*, December 14.

Local Applications of Castor-Oil.—Beloll aserts that warm castor-oil thoroughly applied to the abdomen is often as effective in the case of a child as if taken internally.—*N. Y. Med. Jour.*, Oct. 22, 1898.

Heat in Treatment of Syphilis.—Storoscheff reports the favorable results of local warm baths, compresses, etc., in the treatment of syphilis, according to the experience of Ussass, Kaleschnikoff and Stepanoff.—*Derm. Cbl.*, December, 1898.

Orthoform in Intramuscular Injections.—Loeb and Raff state that the addition of 5 to 10 per cent. orthoform to the 10 per cent. Hg.-salicyl. suspension, renders the injection painless for eight to ten hours afterward.—*Derm. Cbl.*, December, 1898.

Ice in Anal Prolapsus in Children.—Hajech has been very successful in reducing and curing the tendency to anal prolapsus by introducing after defecation a cone-shaped piece of ice 7 to 8 cm. long, with a base 2 to 3 cm. in diameter. It is placed in the center of a piece of iodoform gauze. No bandage is required. —*Semaine Méd.*, December 14.

Infantile Spinal Paralysis.—Lacorse considers electricity the best means to diagnose this affection, and the only means to cure it. Treatment should be commenced as early as possible with the galvanic current, and patiently and perseveringly continued for a long while.—*Ztft. f. Orthoped.*, vi, 2.

Diphtheria Noma Cured with Serum.—A second case is related in the *Deutsche Med. Woch.*, No. 38, occurring in the fifth week of typhus in a child of 8 years. Diphtheria bacilli were found in the noma, which was limited to the cheek, and 9500 units of diphtheria serum injected resulted in a complete cure.

Tuberculosis and Pregnancy.—F. Gomez suggests in the *Gaceta Médica* of December 1, that many cases of "spontaneous death of the fetus" may be due to latent tuberculosis in the mother, and that possibly creosote treatment of the mother during pregnancy might avert the death of the fetus when tuberculosis was known or suspected.

Intestines Resected by the Yard.—Dresmann has resected the intestine for over a meter in twenty-four cases; in four cases over two meters; in one case 3.10 meters in a man of 60 years, and in the case of a boy of 8 years, as much as 3.88 meters. His experience indicates that only a young person can tolerate a resection of more than two meters.—*N. Y. Med. Woch.*, December, 1898.

Differentiation of Pneumo- and Meningococcus.—In young rabbit or human serum the pneumococcus grows uniformly distributed, while the meningococcus is always clustered in chains or masses, spontaneously agglutinated. The meningococcus also develops on gelatin at a temperature of 22 degrees C., while the pneumococcus does not develop at this temperature.—*Semaine Méd.*, December 14.

Diagnosed from Ocular Complications.—Facial neuralgia, moderate astigmatism and crossed diplopia, coryza, and a slightly painful point at the superior internal angle of the left orbit, induced a diagnosis of frontal sinusitis, confirmed by the operation. It was bilateral, and bilateral maxillary sinusitis was also discovered. After evacuating the fetid pus, the neuralgia and ocular troubles vanished at once.—*Presse Méd.*, November 30.

Calot's Forcible Reduction of Tuberculous Spondylitis.—According to the *Ztft. f. Orthoped. Chir.* vi, 2, Hoffa and Zuelzer of Würzburg endorse Calot's method, which has been rejected by many without a trial. Old humps should not be treated in this way; abscesses are also a counter-indication, but paralysis is not. Hoffa is more than satisfied with the results of his twenty-three cases thus operated on, and warmly recommends the method.

Analysis of Woman's Milk.—O. Klemm considers all analysis a farce that does not include microscopic investigation and determine the specific gravity, percentage of albumin, casein, N remainder, amount and melting-point of the fats, and the amount of sugar and of iron. He does not like to treat dyspepsia in the nursling without such a preliminary investigation, and he considers it indispensable in selecting a wet-nurse.—*St. Petersburg Med. Woch.*, December 3.

Fat Embolism after Brisement Force.—Payr noted a complete status thymicus and lymphaticus in a case of fatal fat embolism consecutive to *brisement forcé* of a contracted knee-joint. A similar condition was found at the necropsy of one of the four other cases on record. He observes that the heart is less able to tolerate fat embolism in these conditions, and that bones rarefied and fatty degenerated from long stay in bed render *brisement forcé* a serious intervention.—*Munich Med. Woch.*, 1898, No. 28.

Syphilitic Process Cured by Measles.—A therapeutically suggestive case was reported in *Pediatrics*, March, 1898. A healthy child of eight years suddenly developed abscesses and pains in the bones, presumably tardy hereditary syphilis,

although only transiently improved with specific treatment. There was great emaciation, debility, even inability to walk. A severe attack of measles when she was 12 years of age, arrested and cured all the morbid processes and restored the child to complete health again.

Effects of Hydrogen Dioxid.—Egbert (*N. Y. Med. Jour.*, Dec. 24, 1898) reports experiments as to the effect of hydrogen dioxid on the normal action of any organized ferment and concludes, instead of retarding the normal action of the digestive ferments of the body, hydrogen dioxid may even aid their action, and by virtue of its oxygen-yielding properties it frequently influences tissue metabolism. Also, under certain conditions, it facilitates diffusion of the products of digestion to the animal tissues and their further elaboration for nourishment.

Picric Acid in Burns.—Thiery stated at the French Congress of Surgery that the picric dressing is the best of all for local medicamentous eruptions and that it possesses unquestionable efficacy in most cutaneous affections, and especially for burns. He has never observed any pain from its application, even with children, and he adds that the cases of intoxication that have been reported were all from ingestion of the acid. Accidents observed from its external use should in reality have been attributed to the burn itself.—*Revue de Chir.*, No. 11 (vide JOURNAL, xxxi, p. 138).

Extragenital Syphilis.—M. Joseph has recently observed three cases of "razor chancre," and Rosenthal states that he almost always has one case at least of extragenital chancre in his service. An abrasion of the skin seems to be a necessary preliminary to infection; a razor cut, a crushed finger, burnt mouth, or something of the kind. Infection is not necessarily derived from the barber shop, but may follow a kiss on the cut spot later, "although the number of barber's assistants constantly undergoing specific treatment certainly indicates some danger in the shops."—*Derm. Ztft.*, November, 1898.

Tolerant Regions of the Brain.—An alienist was shot in the occipital region by a patient, but did not know he was wounded, and inquired if any one had been injured, although he died twenty-four hours later of cerebral compression. . . . A patient of Verneuil's received three balls in the base of the brain, but survived forty-eight hours. . . . A man found dead, bathed in blood, had a bullet-hole above his ear, and the pistol was found in his pocket. The sphenoidal lobe was affected —one of the parts of the brain that react most slowly to traumatisms (Gilles de la Tourette).—*Semaine Méd.*, December 14.

Faure's Muscle Suture for Eventration.—After cutting an ellipse out of the weakened skin, the edges of the recti muscles are carefully isolated, and a couple of strips cut, a centimeter in width, and 12 to 15 cm. in length. One is separated from the right side, but left attached at the top; the other from the left side, attached at the bottom of the ellipse, each extending about three-fifths of the entire ellipse. Each strip is then passed over and over through the fascia and muscles, drawing them together, with four to six stitches in all, the ends tied in the center, and firmly fastened with catgut.—*Cbl. f. Chir.*, December 17.

Exaggerated Reflexes in Pott's Disease.—Giacometti asserts that paresis or relaxed paralysis with increased reflexes, indicates an affection of the spinal cord. Relaxed paralysis without pains and without increased reflexes almost always indicates a peripheral injury. Attacks of pain with increased reflexes point to an affection of the root region of the spinal cord. Attacks of pain with diminished reflexes indicate a peripheral affection, but not necessarily the entire absence of a spinal affection. Increased reflexes are an early symptom of Pott's disease. They are sometimes encountered in children who complain only of weariness. They precede paralysis, but are not so serious a symptom as contractions. Even if quite pronounced, complete recovery may still be attained. An early diagnosis is of the utmost importance for the treatment.—*Zft. f. Orthoped. Chir.*, vi, 2.

Protargol in Ophthalmology.—Two recent theses have been devoted to a study of protargol, and both conclude that it has all the antiseptic power of nitrate of silver and argentamin, while it is less caustic, rendering it much less dangerous for the eye. Argentamin is preferable for granulated conjunctivitis, as more of a caustic action is required, but in all other kinds of conjunctivitis protargol rapidly improves and then cures them. If there are recurrences of conjunctivitis caused by Morax' diplobacilli, zinc sulphate will keep them under control. Dacryocystitis is favorably affected by injections of a 5 to 10 per cent. solution of protargol.—*Nouv. Remèdes*, October 24 (vide JOURNAL, xxxi, p. 989).

Epilepsy of Ocular Origin.—L. Chavaz called attention, a year or so ago, to the close connection between ocular troubles and certain cases of epilepsy, and that curing the former frequently resulted in the simultaneous disappearance of the epilepsy, and at least would certainly free the patient from much discomfort. He describes a typic case in the *Gaceta Méd.* of Dec. 1, 1898, a young physician who for six and a half years had had three to twelve attacks of "partial epilepsy" every day, rebellious to all medical treatment, with grand mal at times. There was exaggerated hypermetropic astigmatism and convergent strabismus in one eye. Graduated tenotomy of the rectus internus in both eyes put an end at once to every epileptic manifestation.

Medicolegal Tests for Sperma.—The Florence test proved a disappointment, as it was soon found that a number of the organic secretions as well as the sperma, reacted with the characteristic crystals. But in medicolegal investigations it has been found very valuable as a preliminary measure. The garments to be examined are frequently soiled and of such a texture that it is impossible to discover traces of semen with the naked eye. In these cases the Florence test indicates with precision the absence or presence of any suspicious matter on the garment. If no crystals form, there is no use in investigating further, but if there is a crystal reaction, the spot should be cut out and submitted to a differentiating test with fuchsin or any stain which will bring out the spermatozoids distinctly under the microscope. Professor Beumer: *Deutsche Med, Woch.*, December 8, (vide JOURNAL, xxxi, p. 609).

Heat for Inoperable Cancer of the Cervix.—Westermark has been quite successfully applying Welander's method of treating soft chancres and other ulcerations rebellious to ordinary measures, to inoperable cancers of the cervix. After curetting and igno-cauterizing, he introduces into the crater of the cancer a small serpentine coil of lead or silver tubing, wrapped with a thin layer of cotton and connected by a rubber tube with a cotton receptacle containing water kept at a constant temperature, usually 52 degrees C., by a gas jet, while a second tube carries off the water, which is thus about 42 degrees on the cancer. The apparatus is left working for forty-eight hours, the vulva being carefully protected from the hot water. The pain, hemorrhage and fetid discharges were all completely arrested by this treatment, the cancer was cleansed, the infiltration diminished and the general condition much improved.—*Semaine Méd.*, December 14.

Asthma and Cutaneous Affections.—Kudicke's Berlin thesis asserts that genuine asthma, dating from the first ten years of life, is always accompanied by some skin affection, usually eczema, and that asthma may enhance the gravity of an existing cutaneous trouble or even produce a new eruption, in persons especially predisposed by gout, diabetes, anemia or chronic eczematosis. A skin trouble affecting the sensory nerve terminals, if not too acute, may also induce a cramp or asthma. A

skin trouble increased by asthma, reacts unfavorably in turn upon the asthma. He considers asthma essentially a nervous affection, and adds that there is no such connection between skin affections and the non-genuine asthma, occurring after 10 years of age. He relates a couple of typic cases—one a young girl with eczema and asthma, with urticaria appearing at each attack.—*Derm. Ztft.*, November, 1898.

Sticking-Plaster Bandages for Tarsalgia.—Drenkhahn relates that a butcher's boy, 15 years old, was affected with tarsalgia, or painful inflammatory flat-foot, compelling him to hobble, and frequently confining him to his bed. He applied a bandage of rubber sticking-plaster, as recommended by Gibney-Hoffa for distortion of the ankle, winding three strips, 2.5 cm. in width, after placing the foot in position, beginning on top of the foot, over the tarsal bone and carrying the strip over the outer edge of the foot, across the sole, up over the inner edge, across the instep to the ankle, and spirally up the calf. The lad was then told to put on his stockings and walk, which he did without the least difficulty or pain, and subsequent massage without removing the bandage, with appropriate shoes, soon restored his feet almost to normal. A similar functional success with an adult is also reported in the *Ztft. f. Orthoped. Chir.*, vi, 2.

Sodium Salicylate for Toothache.—Dr. Frederick C. Coley, in an article on the medical treatment of toothache, in a recent number of the *Practitioner*, states that of all medical remedies for toothache he knows of none so successful as sodium salicylate. He believes it is especially useful in those cases where the pain is started by "taking cold." A dose of 45 grains will usually relieve the pain very promptly, and if this is repeated every four hours the inflammation may entirely subside, leaving, of course, a carious tooth to be disposed of according to circumstances. The addition of belladonna is often advantageous. Fifteen grains of sodium salicylate, with 15 minums of the tincture of belladonna, will often procure refreshing sleep instead of a night of agony. It is especially valuable with children, when extraction of teeth is to be avoided, if possible, lest the development of the maxilla should be injured.—*American Therapist*, November.

Jejunostomy.—F. Terrier recently made a lateral jejunostomy in an inoperable case of gastric carcinoma, selecting a point about 18 cm. from the duodenal-jejunal angle, and suturing it to the lips of the parietal wound, but not incising the intestine for a couple of weeks, as the patient could still be fed through the esophagus for that length of time. The wound was closed except the point left for the jejunal mouth, which was opened when necessary, with the smallest point on the thermocautery and fluids injected with a syringe and urethral dropper. There was no regurgitation, and the jejunal mouth worked very well during the month the patient survived. Terrier also describes the case of a young student with a duodenal fistula caused by a gunshot wound. His father kept him alive by collecting the fluid that drained from the stomach through the fistula, and after warming it over water with some meat, injected into the intestine the products of this artificial digestion. The fistula was closed in due time and the young man recovered.—*Revue de Chir.*, December 10.

Dry Dressing for Suppurating Otitis.—Dr. H. Mygind of Copenhagen has been treating parallel groups of cases of suppurations of the middle ear with lavages and instillations on one hand, and dry asepsis on the other. The results established that the dry asepsis cured more rapidly than the other. He first soothed the inflammation with the following solution, warmed, instilling several drops for a few days: cocain hydrochlorate 20 gm., sublimate .005 gm., boiled dist. water 10 gm. When the pain and inflammation have subsided, a dry, aseptic tampon is introduced into the ear and renewed as soon as it becomes wet. Twenty tampons are wrapped separately in paper and given to the patient in a bag of filtering paper. He takes one out at a time, closing the bag at once, being careful not to touch the end of the cotton that goes first in the ear. The otorrhea is usually completely cured by the end of two or three weeks. If the improvement is not decided by this time the dry treatment should be abandoned, and lavages commenced.—*Semaine Méd.*, December 14.

Aseptic Irrigation in Alopecia.—L. Jacquet cures and prevents alopecia by producing a transient hyperemia several times a day with a stiff brush, not stroking with it, but merely pressing it against the surface until the skin is irritated by the pricks of the bristles and becomes hot and red, even pulsating in some cases, this effect lasting thirty to fifty minutes, although comparatively invisible to others. He cured himself of an intractable patch of alopecia in the beard of his chin, a difficult spot to treat. The response has been even more rapid in a number of others treated. He combines with it a vigorous brushing of the entire beard and scalp with a dry brush once or twice a day. Asepsis is imperative; for this he uses oxygenated water, or boils the brush once for all, before each application, dipping it in an oily antiseptic that will blend with the fats of the skin: 96 per cent. alcohol 80 gm., castor oil 20 gm. corrosive sublimate 10 gm., extract of opoponax and tincture of cochineal, each 20 drops, shaking out as much as possible before using the brush.—*Semaine Méd.*, December 14.

Treatment of Epileptic Insanity.—Peterson (*Phil. Med. Jour.*, Dec. 24, 1898) mentioned among new drugs and remedial methods worth of attention, the simulo, a South American plant of the hyssop family, the tincture being given in doses of from one to two or three drams three times daily. His experience with this drug during several years leads him to believe that it deserves trial in most cases, as it is perfectly harmless, which can not be said of the bromids, borax, belladonna, and some other drugs. While he has found it extremely beneficial in some cases, in others it has had no effect at all, and in some it acts very well when combined with small doses of bromid. He also found, especially in old and obstinate cases where other agents had proved ineffectual, that the so-called opium-bromid treatment of Flechsig is of use in many cases. This treatment consists in the administration of opium for some six weeks, beginning with 0.5 or 1 grain t. i. d., and increasing gradually until 10 to 15 grains a day are taken, when the use of the opium is suddenly stopped and bromids in large and gradually reduced doses are given (30 grains four times daily to begin with).

Suprarenal Extract in Ophthalmology.—According to Dr. W. H. Bates, the aqueous extract of the suprarenal gland is the most powerful astringent known. When a drop of a 1 per cent. solution is instilled into the eye, the conjunctiva of the globe and lids is whitened in from forty seconds to two minutes. This original observation was published in 1896, and was soon confirmed by many others. The extract has been used more than 5000 times in all forms of inflammation of the eye, whether traumatic, infectious, or from constitutional diseases, as rheumatism, syphilis, or tuberculosis; it always produced a whitening of the eye. The pupil is not contracted or dilated by it. A tolerance is not established by its use. It has no antiseptic or anesthetic properties. The relief of pain and the quick cures often made are due entirely to its wonderful astringent properties. When used internally, Dr. Bates has found that the best way to administer the gland is to place a few drops of the aqueous extract on the tongue. To recapitulate: As a pure astringent in all inflammations, as a hemostatic, and as a tonic—we might say food—to all muscle-fibers, especially the heart, no therapeutic agent has been employed which can compare with the extract of the suprarenal gland.—*Medical Record*, October 8.

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SATURDAY, JANUARY 14, 1899.

TREATMENT OF TETANUS BY MEANS OF INTRACEREBRAL INJECTIONS OF ANTITOXIN.

In an editorial abstract which appeared in the JOURNAL a few weeks ago, reference was made to the interesting study of ROUX and BORREL concerning the relation of tetanus toxin to nerve-cells. It will be recalled that when the toxin is injected directly into the brain a peculiar form of tetanus, which ROUX and BORREL call cerebral tetanus, results. The symptoms are characterized by psychic excitement, intermittent convulsions, motor disturbances and polyuria, and depend upon the fixation of the ganglion cells. It will also be remembered that WASSERMAN and TAKAKI were the first to make experiments that called the attention of investigators to this peculiar affinity of the tetanus toxin for the nerve-cells, inasmuch as they showed that the same intimate union between toxin and nerve-cells occurs when bits of nerve substance and toxin are mixed together outside the body. ROUX and BORREL also showed that injection of antitoxin into animals affected with cerebral tetanus has no effect, because the antitoxin does not have the same affinity for the nerve-cells as the toxin, does not therefore come in contact with the poison, and proves entirely powerless against the poison that has already been fixed by the nerve-cells. This they considered to be one of the principal reasons why, in man as well as in animals, subcutaneous or intravenous injections of antitoxin in tetanus so often fail. The antitoxin may, of course, neutralize the toxin circulating in the blood, but in order to accomplish most, the antitoxin should be placed where the toxin is acting; of forty-five tetanized guinea-pigs treated with intracerebral injections of antitoxin, thirty-five recovered, whereas seventeen treated with subcutaneous antitoxin injections all died, excepting two. Theory and experiments seemed to agree beautifully.

The striking results obtained in animals have justified the intracerebral injection of antitoxin in man. Inasmuch as it may be considered that this form of treatment would afford the patient the only chance possible, he should have the benefit of it, although it might be objected that the risks connected with this treatment are numerous.

In an article containing a résumé of the reports of cases treated by means of intracerebral injections of tetanus antitoxin, RAMBAUD[1] finds that the risks are in reality trivial. If the intracerebral injection is made in a neutral area, as for instance in the frontal lobes, the results of the trauma are reduced to the minimum. Under all circumstances the injury caused by the insertion of a fine hypodermic needle into the brain is trifling; the quantity of serum introduced is small, and when introduced slowly no undue compression needs to be caused. Hemorrhage from the pia and dura can be readily avoided, and the button of bone removed being preferably small, healing takes place rapidly. At the same time as intracerebral injections are the most efficient mode of treatment, it is nevertheless necessary, for the reasons already alluded to, to employ intravenous and subcutaneous injections of antitoxin, in order to neutralize the toxins circulating in the blood and that which is continuously being secreted at the site of the injury.

The first human case treated in this manner occurred only two months after the publication of ROUX and BORREL's researches. Of the twelve cases which have now been treated by this plan, three have occurred in this country, the first being one published in the *New York Medical Journal* for Dec. 17, 1898, by CHARLES A. CHURCH of Passaic, N. J. Recovery took place. RAMBAUD refers to two more cases, one of which died from tetanus. In the other of these cases, in which the tetanus developed ten days after a laparotomy, the tetanic symptoms subsided after intracerebral and subcutaneous injections of antitoxin, but death resulted, apparently from anemia, nephritis and sepsis, the fatal issue taking place eleven days after the complete disappearance of the tetanic manifestations, which were of the bulbar type of tetanus, and consequently, according to ROUX and BORREL's teaching, of bad prognostic omen. In these two cases, one may therefore be said to have recovered under this mode of treatment.

The most delicate part of the operation in intracranial injection is the injection itself. It is necessary to have a very perfect syringe, which must be absolutely aseptic. In order to make it possible to inject the antitoxin slowly, drop by drop, RAMBAUD

[1] New York Medical Journal, Dec. 17, 1898.

has constructed a syringe which holds 3 c.c., the rod of which fits a thread inside the cap, so that the injection can be made by a screwing motion of the thumb-piece. The head of the needle is of conic shape, in order to fit the trephine hole made in the skull. The trephine used in RAMBAUD'S cases had a crown whose diameter was about 7 mm. The cone-shaped head of the needle makes it possible to firmly fix the needle in the trephine hole; between the needle and the syringe is a flexible rubber tube connection. With this arrangement there is no risk of the needle moving after it has been properly inserted. The injection should be made in from ten to twelve minutes. The cone of the needle is provided with a groove so as to afford passage to any fluid which might otherwise cause compression.

It would seem that this mode of treatment of tetanus, the mortality from which is yet very large, even when treated promptly by means of the ordinary subcutaneous or intravenous injections of antitoxin, would merit an extended trial. The actual results of the intracerebral injections of antitoxin can only be fully determined when a large number of cases have accumulated. It may also be allowed to indicate that in all probability a single intracerebral injection of tetanus antitoxin will not always suffice to neutralize the toxin fixed in ganglion cells, scattered perhaps over a large part of the brain. It may be found necessary to make several injections into the brain in various places.

QUININ IN MALARIAL HEMOGLOBINURIA.

From time to time we read articles in which the assertion is made that the administration of quinin during the existence of hemoglobinuria in malarial infection aggravates the symptom. In fact, it is held by some writers and practitioners that quinin will produce this condition in malarial fever. While this view is sustained by some who practice medicine in malarial districts, it can be positively stated that the vast majority of practitioners in those districts do not hold to any such belief.

As we have increased our knowledge concerning the nature of malarial fever and the plasmodium which produces it, to that extent have these vagaries once propounded and upheld been refuted. At a time when malarial fever was believed to be due to carbonic acid, organic material, effluvia, paludism, and various other theories devoid of proof, and at a time when bacteriology and pathology had not been established upon irrefragible evidence, many plausible theories were set up only to be dissipated by the scathing light of definite knowledge established by the study of these two branches of medicine. Bacteriology has taken malarial fever from the category of diseases of unknown cause and placed it forever among the infective diseases. Pathology has shown us the condition existing during the life of the patient.

In malarial fever we have come to study the internal organs and we find that the spleen is enlarged, soft and congested, the blood-vessels being filled with red-blood cells in all stages of disintegration, leucocytes, blood pigment and the plasmodium in various stages of development. In the liver, congestion is the rule, producing a stagnation of the portal circulation and a deficiency of bile, while the kidneys may be enlarged, but in most cases show no evidences of parenchymatous or interstitial change.

In the kidney of malarial hemoglobinuria, THAYER, PELLARIN, KIERNER and KELSCH have shown a condition bordering on a parenchymatous degeneration with interstitial hemorrhages and blood corpuscles in the tubules, yet this condition is frequently found in other conditions than malarial fever and in which quinin may be used with impunity without producing hemoglobinuria.

It should be remembered that it is not alone from the study of the internal organs that our knowledge has been obtained regarding this subject, for the plasmodium has become more bold and exhibits itself in the peripheral circulation. Here then its cycle can be observed and studied—first as the small hyaline segment, with a rotatory, twisting and branching movement, next, as the flattened yellowish or hyaline cell of many sizes and shapes, and last, as the full-grown, vigorous organism containing fine masses of hemoglobin, which has been derived from the red-blood cell set free by the necrobiotic process engendered by its toxin.

With each paroxysm there is set free in the circulating medium more hemoglobin, which must be stored in the organs whose duty it is to receive it. The internal viscera have no choice but to receive its repository and when it is thrown off they receive the legacy of its coloring agents which remain in the intracellular tissue. Briefly, this may be said to be a summary of the morbid anatomy of malarial fever, which also includes hemoglobinuria of malarial origin, which must be considered a symptom and not a distinct entity. It should also be remembered that the bright red urine observed is not always a hematuria. In fact a hematuria is the rare exception, for hemorrhages, of whatever nature, are uncommon in all varieties of malarial fever. It is the blood coloring matter, and not the red-blood corpuscles, which produces the glow in the cheek in the fastigium of the fever and its absence which denotes the pallor of a cachexia. But in the later stages of a congested kidney, blood corpuscles may be present.

Why the hemoglobinuria of malarial origin has been singled out among all the other varieties and stated to be increased by the use of quinin, is not clear. Thus we have: 1, paroxysmal hemoglobinuria, and 2, toxic hemoglobinuria, including that due to chlorate of potash, carbolic acid, naphthol, carbon dioxid, and the poisons of infectious fevers, yellow fever, scarlet fever, typhus fever and malarial fever.

The rules of logic by which some endeavor to prove the sequence of events from the administration of quinin to the production of hemoglobinuria are not circumscribed within the boundary of therapeutics; no such proof exists. Preponderating evidence plainly shows that quinin in the largest doses will neither lead to a hematuria nor a hemoglobinuria. It neither causes a necrobiosis of the red-blood corpuscles, nor causes a congestion of the kidneys. Thus, BAILLIO reports two soldiers who took three drams of quinin, producing in both cases, cramps in the epigastric region, accompanied by vomiting, paleness of face, dilated pupils, irregular, slow pulse, ringing of the ears, syncope, and death in one case, while in the other the symptoms gradually disappeared. BRIQUET reports a case in which a man took fifty-five drams of the salt without the production of hemoglobinuria or hematuria, and GUERSENT has observed a woman who became deaf, dumb and blind after having taken ten drams of quinin sulphate within a few days.

The foremost physicians who practice in malarial districts are not afraid of quinin. If four grains of quinin every four hours will not break up a chill, ten and fifteen grains are given with impunity and without producing a hemoglobinuria; and if fifteen will not suffice in a case of pernicious fever, thirty grains are frequently given hypodermically.

The exact chemic composition of the toxin produced by the plasmodium malariæ is unknown. That it is actively poisonous is beyond a doubt. Thus a small amount of blood from a patient suffering with malarial fever has been obtained and transfused into another patient, with the result that a malarial fever has been produced. The urine of a patient suffering from malarial fever has been found to be more toxic immediately after the paroxysm than before it. The rupture of the enveloping membrane of the affected red-blood corpuscle marks the onset of the paroxysm and the chill. Fever is only the reaction of the system to expel the poisonous material.

Having, therefore, the two factors, quinin and toxin, in the blood concurrently, which one will be most patent in the production of hemoglobinuria? The toxin of malaria causes a hypertrophy of the spleen, will destroy the red-blood globules, will cause a chill, and being poisonous, may irritate the kidneys, while quinin has never been proven to be the etiologic factor in any of these conditions, and therefore must be the least causal agent in the production of a symptom for which it should be used.

ALBUMINURIA IN DISEASES OF CHILDREN.

The frequency with which albumin appears in the urine of children makes it imperative that some classification as regards its significance, its influence on diagnosis, and especially on prognosis, be made. The division into primary and secondary albuminuria is merely a cloak to hide our ignorance, for the diseases in which primary albuminuria or albuminuria with definite and marked renal changes (TIRARD) occurs, may not infrequently instead be accompanied by the so-called secondary albuminuria, or albuminuria in which the subsequent course of the disease leads us to infer that the renal changes were of the most trivial character. Thus, the albuminuria occurring so commonly in scarlet fever and diphtheria, we are accustomed to regard as primary, because there is commonly an acute nephritis or, more correctly speaking, a glomerulo-nephritis which, postmortem, is plainly evident, or, if the case progresses to a favorable termination, is followed by symptoms of subacute or chronic nephritis; though, on the other hand, we all know how common it is in either of these diseases to have a total disappearance of the albumin from the urine without subsequent reappearance, when we look upon the instance as one of secondary albuminuria without renal structural change. We often call such albuminuria febrile, because with the disappearance of the fever the albumin also gradually disappears from the urine. In the primary albuminurias, too, we often find diminution in amount of suppression of urine; the latter, if present, is very highly albuminous and contains large numbers of casts, and there are dropsical effusions into the various serous cavities and into the subcutaneous tissues. It were better, perhaps, to speak not of primary and secondary albuminuria, but of albuminuria with severe or albuminuria with slight structural change, for it is pretty definite that there can be no exudate of albumin through an intact dialyzer, as the perfectly normal kidney certainly is—if it were not, albumin would be a constant normal urinary ingredient. The change may be only epithelial in its involvement, nevertheless it is organic; it may be quickly repaired, and the kidney never show sign of the departure from the normal; the albuminuria also disappears. As regards whether it is "primary" or "secondary" it is often impossible to state; and if it were, for what good? It is the exact condition of the kidney that we wish to know after all.

The delicacy of structure of the organism of children makes them relatively more susceptible to the onset of infectious diseases than is the case with adults. In like manner each individual system in the child's body is more prone to escape from the normal. For instance, we are all aware of the frequency with which albumin appears in the urine of children with elevation of temperature. Formerly we looked upon this symptom as one of the frequent accompaniments of the fever itself; but of late years the consensus of opinion seems to be that the albuminuria and fever are both dependent upon the same cause, namely, the toxins of the individual disease; in other words, a toxic rather than a febrile albuminuria. And the former seems the more fitting term, because we very commonly see large amounts of albumin in the urine

with but a low type of fever, showing that the height of temperature has no certain action at least on the amount of albumin in the renal secretion. On the contrary, the more the system is overwhelmed by the weight of toxins, the more pronounced the albuminuria; indeed, it is these very toxins that are doubtless the cause of the true nephritis that so often leads to such deplorable results.

One of the most common of the infectious diseases of childhood in which we find an albuminuria of more or less marked degree is whooping-cough. It would be difficult to go through a ward containing patients afflicted with disease and not find one or more instances. It does not seem that the number of the paroxysms has as much to do with the presence of our symptom as the severity of the individual attacks. TIRARD, in the *International Clinics*, October, in speaking of this subject, says: "When the paroxysms are severe and prolonged, we find that the occurrence of albuminuria is more probable, and that the symptom diminishes gradually when the disease is relieved, either by the use of remedies which facilitate the act of coughing or when the disease is approaching its natural time limit." When we remember that hemorrhages into the conjunctiva and attacks of epistaxis are also far more common in severe paroxysms, and bear no relation to the number of attacks if mild, we find the explanation of the above mentioned fact: a venous congestion in the kidneys resulting from interference by the paroxysms with the act of respiration. Thus, it may be that the albuminuria is one day excessive, the next slight, just as it may be that it is one day slight and the next absent, or it may be absent for several days. The appearance of the urine is usually normal, though from concentration a precipitate of urates may fall.

Just as in whooping-cough an albuminuria may occur from venous congestion, so in heart disease, though in the latter the backward pressure is directly dependent upon the defect in the circulatory apparatus. This albuminuria is practically identic with that occurring in adults afflicted with cardiac disease. For years the urine may apparently differ from the normal in that it is slightly diminished as regards the amount passed per day; its color is deeper, and its specific gravity is higher. The microscope will show urates in excess, perhaps a considerable amount of epithelial débris, and occasionally a red corpuscle forced from its vessel by the very intensity of the congestion. Edema, if its occurs, is not edema of Bright's but that of the cardiac disease of adults, beginning in the feet and involving the serous cavities later if at all. But as the years roll on, the picture changes and the urinary symptoms become the prominent ones. The chronic congestion has led to interstitial changes, and the typic interstitial nephritis with small red kidney presents itself. So similar are its symptoms to those of the cirrhotic kidney of alcoholism, which latter is so often followed by a hypertrophied left ventricle and relative mitral insufficiency, that it is impossible in a patient seen for the first time, in whom mitral incompetency and chronic insterstitial nephritis are combined, to tell whether the heart disease is secondary to that of the kidney or the kidney trouble secondary to that of the heart. Among other causes of albuminuria in children, according to TIRARD, the rôle played by drugs is a most important one. We are all of us familiar with the danger incurred by the prolonged use of salicylates, especially salol, even in adults. In children the risk is much greater. The other drugs that are liable to produce severe renal changes in adults, the local use of turpentin and cantharides, are particularly dangerous to children. Arsenic should be used with the greatest caution, and its effects on the kidneys, as shown by the urine, watched most carefully. Perhaps the most dangerous of drugs in its effects on the kidneys of children is chlorate of potash, which is so indiscriminately prescribed as a gargle. Undoubtedly a considerable amount is frequently swallowed, becomes absorbed, and its deleterious action is exerted upon the red corpuscles, resulting in their destruction. The kidney substance itself also suffers largely. Albuminuria necessarily follows. These various drugs may exhibit their action by no microscopic change, by the appearance of a few red corpuscles in the urine, or by a hematuria visible to the unaided eye, depending upon the dose, the toxicity of the poison, the resisting power of the kidney and its eliminative activity. A recognition of the cause of the albuminuria and the prompt withdrawal of the drug is usually followed by a rapid disappearance of the symptoms except, perhaps, in the case of potassium chlorate poisoning, where numerous deaths are known, and where there are undoubtedly many more whose death has been ascribed to other causes.

The last cause for infantile albuminuria to which TIRARD directs particular attention is that depending upon suppurative changes occurring in any part of the body, provided such changes are prolonged over a considerable period of time. Tubercular bone disease with secondary infection by pus organisms is the typic form of this variety of suppuration, and eventually results in amyloid disease affecting the various organs, particularly the spleen, liver, kidneys, intestines, and lymphatic glands. The amount of albumin in this affection is, as in adults, quite large, but the specific gravity is low and the color a pale yellow, almost colorless. As in chronic interstitial nephritis, the amount of urine is increased. The microscope sometimes reveals casts responding to the iodin reaction for amyloid disease.

A RECRUDESCENCE OF INFLUENZA.

According to a Washington dispatch of January 9, "Surgeon-General WYMAN, of the Marine-Hospital

service, says that the [present influenza] epidemic started in Turkey and Asia Minor about the middle of November, and has been spreading westward ever since, following the established lines of travel and being most severe where the population is most dense." It is further added that "Dr. WYMAN is now taking measures to obtain information as to the character, extent and treatment of the disease in foreign countries, as well as in the United States, and special observations are being made as to its origin and means of contagion."

Epidemiologists generally will welcome this promised assistance in the study of a disease, which though not usually the cause of death per se, is the contributing cause of a greatly increased mortality from the principal causes of death whenever it appears as an epidemic.

If, however, this study and the "special observations as to its origin" are to be of any real value, the head of the Marine-Hospital Bureau will do well to disorient himself and instruct his observers that, notwithstanding his dictum, they are not to assume that every endemic outbreak of influenza is necessarily a new importation from Western Russia, Turkey and Asia Minor. They will find a fruitful field for special observations, not only in Europe but in this country and under their own noses, in the frequent recrudescences of the disease ever since the subsidence of the last pandemic—that of 1889–92.

There is no occasion to go so far afield as Turkey and Asia Minor for the present endemic, at least in this country; and, even with the modern methods of rapid transportation, an outbreak in the far East, occurring last November, will hardly account for the local endemics of the past twelve months in places so remote from the Orient and from each other as New York and Chicago. In the former city there was a well-marked prevalence of influenza during the winter of 1897-98, the first deaths from which were reported during the week ended Jan. 15, 1898, and to which 97 deaths from the uncomplicated form of the disease were attributed before its subsidence in the early part of May, in addition to a great increase in the mortality from diseases complicated with the endemic disease. During August and September there was a complete remission, but about the middle of October its presence was again recognized and one death was recorded during the last week of the month, 12 in November and 115 in December up to the 24th—the latest report received.

In Chicago the early outbreak of 1898 was even more severe and widespread—21 deaths in the last ten days of January, 94 in February, 116 in March, 27 in April and 13 in May, a total of 271 influenza deaths in five months. There was only an occasional death reported during the remainder of the year, until in the early part of November the disease began to appear in death certificates as a "contributing cause" with increasing frequency. Between December 2 and 28, 11 deaths were recorded from influenza as "the chief and determining cause."

These facts and figures, both as to New York and Chicago, do not consist with the assertion that the present "epidemic started in Turkey and Asia Minor about the middle of November." It is more probable that the outbreaks in the early months of 1898 and at present are simply illustrations of the rule framed by many observers—most recently by OSLER—that, "following the pandemic there are, as a rule, for several years endemic or epidemic outbreaks in different regions.'

Meanwhile, it will be more profitable than any special observations of the geographic and historic pathology of the disease—which line of research has already been well covered by HIRSCH, HAMILTON (J. B.) and others—to take advantage of the present outbreak, to study the bacteriology of influenza with reference to certain mooted points of the greatest interests to physicians as to treatment and to sanitarians as to prevention. Is there an *influenza vera* due to a special germ—the Canon-Pfeiffer—whose toxin profoundly affects the nerve and trophic centers as the toxin of the Klebs-Loeffler does in true diphtheria? Is there a pseudo-influenza—the so-called "grip" of the laity, the "ordinary influenza cold or catarrhal fever"—due to a mixed infection, from which the specific serum is absent, comparatively harmless as to the vital centers, and bearing the same relation to *influenza vera* that pseudo-diphtheria does to the true diphtheria?

If these questions shall be answered in the affirmative by the bacteriologist, as now seems probable, the bacterial diagnosis of influenza will be only less necessary than that of diphtheria, and may be followed by as satisfactory results.

GLANDERS IN HAVANA, CUBA.

Yellow fever is not the only infection which the American sanitarian will have to stamp out when he takes up his official abode in Havana, Cuba. The death-roll of this city from glanders is something appalling. The Surgeon-General of the Army has received a report from HONORE F. LAINÉ, a graduate, 1895, of the Veterinary College of New York, which shows the need of sanitary work in a hitherto unthought of line. Dr. LAINÉ, being a Cuban with an American diploma, met with great opposition in the practice of his profession among his colleagues, who were all Spaniards. During the five years of his practice in Havana he repeatedly called attention to the bad sanitary condition of the stables and the neglect of the government in allowing glandered horses to work in the streets of the city; but he was unable to obtain the co-operation of his colleagues in this matter, as the owners of the large stables and omnibus lines were all Spaniards, and some of them very influential in local politics.

A young lady belonging to one of the best Cuban families died of glanders, and the authorities were compelled by the clamor of the press to take action in the matter. A committee was appointed by the Board of Health to examine the stables of the city, and Dr. LAINÉ was assigned as its veterinary expert. The Committee met with great opposition from the owners of the stables, who refused to allow their diseased animals to be killed. In the omnibus stable of Don PEDRO ESTANILLO, a rich and influential city councillor, two horses were found with unmistakable symptoms of the disease. The owner objected to having them killed, and obtained a certificate from a Spanish veterinary surgeon that the horses were suffering merely from a chronic nasal catarrh. The Committee proved their case by inoculating two asses with the nasal secretion of the diseased horses. Both animals died before the fifteenth day, and unfortunately, also Mr. FERNANDEZ DIAZ, one of the members of the Committee, who became infected while assisting Dr. LAINÉ in effecting the inoculations. No action was taken, notwithstanding these conclusive proofs, and the Committee decided that it was useless to continue its work.

According to Dr. LAINÉ's observations, the disease has greatly increased of late among the horses of the city. Farcy, which is compatible with work, is the form of the disease most frequently seen on the streets. The infection is thus spread to persons whose occupations do not bring them specially in contact with the diseased animals. Among those who have died during the past nineteen years are doctors, lawyers, notaries, ladies, and men of various occupations not connected with the care of horses.

Dr. LAINÉ closes his report with a list giving names, residence, occupation and date of death of those who have died of glanders in the Mercedes Hospital from 1880 to date, Dec. 3, 1898. The list includes the names of 101 persons, an average of 5.3 persons per year. The largest number in any one year was 13, in 1884; 12 deaths occurred in 1895. These numbers do not include the victims who succumbed to the disease in their homes or in other hospitals.

SURGEON-GENERAL STERNBERG IN CUBA.

The Surgeon-General of the army is on a tour of inspection of all the government hospitals in Havana and in general of all military hospitals in the Island of Cuba. He left Washington, D. C., Jan. 3, 1899, accompanied by Capt. E. L. MUNSON, asst.-surgeon, U. S. A., as an aide. The long death-list from yellow fever among the Spanish troops in Cuba in 1897, the first season after the arrival of large reinforcements from Spain, shows what our troops may expect during the coming summer unless every precaution is taken for their protection. The Surgeon-General is already familiar with the general conditions on the island, from his residence there while a member of the Yellow Fever Commission; but a personal inspection of the local conditions surrounding the various camps and garrisons is needful to enable him to institute his measures to the best advantage. According to the military journals, Dr. STERNBERG will take into consideration the establishment of a yellow fever hospital in Havana, and they suggest that with the greater knowledge of this formerly dreaded disease which the recent war has given our medical men of the army it is not too much to expect that the Surgeon-General may find it possible to insure practical immunity from the ravages of yellow fever among our troops in Cuba next summer. "This problem of yellow fever, its prevention and cure, presents one of the most interesting of the many now before the medical fraternity of the country, and especially of those in the army. General STERNBERG realizes that now is the time for perfecting such arrangements as may be adopted for the inevitable conflict with the fever, and it is said he has high hopes of initiating such a system of sanitary reform as shall redound to the credit of the modern medical officer given full swing in the treatment of the customary unconquerable diseases of the present time."

CORRESPONDENCE.

The Geographic Distribution of Leprosy.

NEW YORK, Dec. 20, 1898.

To the Editor:—In *Janus* of September-October, 1898, there is part of an article by Dr. Ehlers, entitled, "La distribution Géographique de la Lèpre." I had been invited by Dr. Ehlers, in a letter dated Feb. 23, 1897, to write such an article. My answer was that everything I know about the question is on record, and that no new work on the subject was required. However, if something new about the geographic distribution of leprosy is to be said, let it at least be the truth. If the little statistics to which Dr. Ehlers seems to have devoted his life, and on which his great reputation as a leprologist is founded (cases seen in Iceland, the Balkans, etc.), are as true as the paragraph about Japan, in this article, not much can be gained by studying his notices. He says: Le Japon est très ravagé par le fléau (Kitasato, iii, p. 267[1]) Now, Kitasato's statistics as presented to the Conference were incomplete, because he had omitted Osaka, one of the three capitals; Kanagawa, which is Yokohoma, the biggest seaport of the empire; Nara, the oldest leper village in Japan, just outside of Kioto, the ancient capital of the empire; Shizuoka, the home of the Tycoons; Miyagi; Ehime (Ychime?); Saga; Miyazaki, the home of the Kiushiu statesmen, and Kagoschima, the home of the Satsuma clan, the political center of the empire. It was the Satsuma men who overthrew the Tycoon and gave the sovereign power to the Mikado. Kitasato evidently did not want to insult these holy and influential places, and the personages in power there, by putting on record that they were being punished for sins of themselves or their ancestors, for such is the meaning given to leprosy by the Japanese. Noting this insufficiency of Kitasato's figures, I wrote to Japan and obtained from Mr. Goto, the chief of the sanitary bureau of the Government, the full statistics and published them in the *Medical Fortnightly*, Aug. 15, 1898, with some remarks of my own. In the places omitted by Mr.

[1] Mittheilungen und Verhandlungen der wissenschaftlichen Lepra Conference zu Berlin, i-iii.

Kitasato, are registered the following numbers: Osaka 372; Kanagawa 118; Nara 125; Shizuoka 529; Miyagi 111; Ychime 466; Saga 527; Miyasaki 897; Kagoschima 603. With these additions, the official record in the Secretary-General's Lepra-Conference publication is complete. I may observe, in passing, that if Dr. Ehlers will read the article of mine entitled "The Number of Lepers in Japan" (*Medical Fortnightly*), he will learn that there are over 100,000 lepers in Japan, and why the Japanese do not put on record their lepers if they can help it. There are more lepers in Japan unrecorded than there are recorded ones. This is in part true all over the world. Dr. Murata, in a late article, gives the number which he believes to be the right one, of the Japanese lepers; it is at least 75,000, according to him. He says that if measures are not very soon instituted to suppress the disease, and to prevent the hiding of those afflicted by it, *half of the forty millions of Japanese will be lepers in a century or two.*

The sanitary office of Berlin, says Dr. Ehlers, meaning, I suppose, the office of Tokio, considers the lepers as being equally distributed over the country. This is another error in the three and a half lines which Dr. Ehlers has devoted to the question of leprosy in Japan. According to my map of lepers in Japan, which was made for me by my friend, the editor of the *Jiji Shimpo* (*Tokio Daily News*), there are in the southern provinces at least twice as many lepers as in the northern; the northern provinces run in the hundreds, two hundred, three hundred, four hundred, five hundred, six hundred, the latter the highest number. The southern provinces present the numbers five hundred, six hundred, seven hundred, eight hundred, nine hundred, one thousand, twelve hundred, and even (Kumamota) 2473. It seems as if leprosy in Japan had sifted to the south.

Another mistake in Dr. Ehlers' three and a half lines, devoted to the subject of leprosy in Japan, consists in the statement that "la lèpre se moutre tant sur les côtes que dans les montagnes." The fact is that the mountainous regions are much more afflicted than the seashore. The mountains of Narita, Minobu and Zozu are densely crowded with lepers; almost the whole population is leprous. Dr. Ehlers can not possibly know, as he has not been sent by the Danish Government *on a perilous and disagreeable voyage to Japan*, that for *1200* years it has been the habit of lepers, believing that they were being punished for sins, to crowd to the holy mountains, and to live there, only wandering from one mountain to another. Where the number of lepers is greatest the infection reaches its highest degree. In this way the inhabitants in the mountains of Japan have become infinitely more contaminated than the population living on the coast.

I can not help thinking that the reader of this article will forcibly be reminded of the definition of the crab, in which there were only three mistakes, but mistakes which covered the whole definition of the animal; it is not a fish, it is not red, and it does not walk backward. Twenty-two thousand is *not* the number of lepers in Japan; the lepers in Japan are *not* equally distributed over the country, and leprosy does *not* show itself there as much on the coast as in the mountains.

ALBERT S. ASHMEAD, M.D.

Value of Transfusion.

PHILADELPHIA, PA., Jan. 2, 1899.

To the Editor:—In the course of an interesting editorial on the "Value of Transfusion," in the JOURNAL, Dec. 31, 1898, the operation is suggested in typhoid fever and other toxic conditions, and the statement is made that there is no literature at hand: i.e., presumably, no record, of the measure having been resorted to in the treatment of typhoid.

In Volkmann's *Sammlung klinischer Vorträge* (No. 11, 1880), Hermann Sahli gives an account of two cases of typhoid fever in which he injected, beneath the skin of the abdomen and elsewhere, as much as a liter of a saline solution. In a footnote in the course of my article on typhoid fever, in the "System of Practical Therapeutics," edited by Prof. H. A. Hare (vol. ii, p. 290), I briefly referred to Sahli's work and have also mentioned the fact that I have treated, at the Philadelphia Hospital, with apparent success, a number of cases of pneumonia by means of "hypodermoclysis."

FREDERICK P. HENRY, M.D.

Restoration of Hearing

MACON, GA., Jan. 4, 1899.

To the Editor:—I send you the following sketch of a case which I believe to be unique: In July of last year there was brought to me for treatment a young white man, and the following history given: Born in Georgia, 18 years of age, he had never had any serious sickness, and gave no history of any of the eruptive fevers, but was born deaf. On careful examination I found him in a generally good physical condition, all organs except the ears performing their proper functions. Bone conduction of sound was acute and a rudiment of hearing by aerial conduction sufficient to catch only the highest pitch of the human voice thrown directly into the left ear. The tympanic membranes were tightly distended and the turbinated bones enlarged. Since he could not hear he could not speak. He exhibited a great desire for me to take his case, which I hesitated doing because he had been through the hands of several prominent physicians, and I believed they had done for him all that books suggest, but I was much surprised and greatly gratified when, after being treated twice, he gave positive evidence of having heard me speak. And now, after a lapse of five months, he hears the tick of a watch at two inches, and is capable of using the telephone. I presented the patient before the Macon Medical Society in September, and explained the original method of treatment pursued. I do not detail the same here, as I hope to present the case and read a paper before the Georgia State Medical Society in this city in April.

As a matter of interest I will add that the young man is fast learning to talk, his wages have been more than doubled by the manufacturing company for which he wraps soap, and he has had his mother brought from a distant city, and is supporting her and a small half-brother. Such a story may need corroboration, and if so, I will gladly furnish the necessary reference.

Yours truly,

MAURY M. STAPLER, M.D.

Malingering.

UNIONVILLE, N. Y., Dec. 29, 1898.

To the Editor:—On Aug. 20, 1898, the JOURNAL considerately published a letter from me, on "Malingering," that recited a case in which suit for malpractice had been instituted. It seemed to me that the matter was of general interest to the profession then, as the outcome is now, so an outline of the progress of the case is here given, in order of time: The plaintiff's attorneys wrote me asking for a settlement by a certain time. I answered that there was nothing to settle. They then served first papers, without complaint, in a suit for $5000 damages, and I at once employed a careful and experienced attorney, and instructed him to push the suit to an issue without any delay whatever. Complaint asked for and received in two or three weeks. It was as follows: Damages demanded for "careless, negligent, wrongful and unskilful treatment" and "careless negligent and wrongful advice"—a set formula I suppose.

By the laws in New York State, in these cases, the defendant can take the plaintiff before a referee's court and have examination by the plaintiff to determine the specific charges, and examined physically by a physician appointed by the court to determine the nature of the alleged wrong treatment. Appli-

cation was made for this referee's court. At this the plaintiff's attorney offered to withdraw the suit, which was refused, and the court appointed referee and physician for this examination. The plaintiff's attorney offered to send discontinuance papers to my attorney, which was refused. Referee's court held. Specific charges were: 1, "The use locally of nitrate of silver in solution when plaintiff was menstruating, which, in her opinion, at that time, would poison her blood"; 2, "refused to call in consultation and thus allowed her disease to become chronic"; 3, "advised her to take treatment of a clairvoyant." Physical examination by Dr. T. D. Mills, Middletown, N. Y., showed treatment had not been improper nor injurious. For these absurdities a firm of lawyers, it appeared, expected to make it so interesting for me that I would pay hush money for them to drop it.

My attorney placed the case on the Superior court calender for the November term, and I prepared myself to disprove each charge, but well knew that they were not sufficient for damages; besides I knew that the plaintiff could not prove a single one. The case was called in the Supreme court, Newburg, N. Y., Nov. 7, 1898, with defendant ready for trial. The plaintiff, not ready, wanted to put it over, but the defendant objected, which objection the court sustained. The defendant asked for a day for trial and the plaintiff parried, but defendant held either for a trial or to allow a dismissal of the case with costs on the plaintiff. The plaintiff then confessed they had no case ready, their bluff was at end, and the case was dismissed with costs on the plaintiff, amounting to $104.30, for which amount judgment was taken. The entire cost to the defendant was about $85.00, which is returned when the plaintiff pays her judgment; time of proceedings from Sept. 1, 1898, to Nov. 7, 1898.

Can any physician who might run in one of these experiences learn from this the following lesson: The case had no merit, as in most of these cases; the plaintiff's lawyer expected the defendant to settle out of court by paying a few hundred dollars to prevent public talk and criticism, which was discouraged by the defendant pushing the suit to trial; also that cases of this kind are taken up by some lawyers on speculation, and as physicians are not lawyers they may be frightened into a settlement; that one case of this kind pushed to an issue is worth more to the profession that it costs the defendant, by deterring patients as well as lawyers from taking them up; that if a matter of this kind is dropped before a public issue is made, many may or would say the "Doctor paid to hush it up;" that to make public to the profession all the facts in a matter of this kind is a valuable guide to any physician who may fall in the hands of one of these malicious persons and lawyer sharks; that the helps and suggestions I received from other physicians show that the members of the profession protect one another.

Sincerely,

F. W. DENNIS, M.D.

SOCIETY NEWS.

Central Texas Medical Association.—This association held its eleventh semi-annual session at Waco, Texas, Jan. 10 and 11.

Marion County Medical Society.—At the annual election of officers of this society, held at Marion, Ohio, January 3, Dr. H. Chisholl was chosen president, Dr. A. Ogan, vice-president, Dr. Ramroth, secretary, and Dr. O. W. Week, treasurer.

Winona County Medical Society.—At a meeting of this society held January 3, at Winona, Minn., the following officers were elected: President, E. D. Keyes; vice-president, J. W. Scott; secretary, J. B. McGaughey; treasurer, N. S. Lane.

Central Wisconsin Medical Society.—This society held its third quarterly meeting in Beloit, December 29, and elected the following officers for the ensuing year: President, F. T. Nye of Beloit; vice-presidents, T. W. Nuzum of Broadhead, W. H. Sarles of Milwaukee, T. M. Miller of Rochester, and C. S. Smith of Elroy; secretary, C. S. Sheldon of Madison.

Morgan County (Colo.) Medical Society.—The annual meeting of this Society was held recently and the following officers elected: President, L. J. Harvey; vice-president, J. W. Harris; secretary, C. E. Black; treasurer, H. C. Harpel; board of directors, T. W. Wakely, A. L. Adams and C. R. Vertrees.

Salt Lake Medical Society.—At the twenty-fourth annual meeting of this society, held recently, the following officers were elected for the ensuing year: President, R. W. Fisher; vice-president, E. I. Thorn; secretary, S. Ewing; treasurer, M. A. Hughes; librarian, W. W. Betts.

Sixth International Congress of Otology.—This Congress is to be held in London, Aug. 8 to 12, 1899. The subject announced for general discussion is: "Indications for the Opening of the Mastoid Apophysis in Chronic Suppurating Otitis of the Middle Ear." Secretary, Dr. E. C. Baber, 48 Brunswick Square, Brighton, England.

St. Joseph (Mo.) Medical Society.—This Society held its annual reception Dec. 31, 1898. The evening was devoted to a "smoker," to which the physicians of the surrounding district were invited. Dr. Thomas H. Doyle was toast-master and an address on medicine was made by P. I. Leonard, president of the Society. Toasts were also given by members of the Society.

Hartford Medical Society.—At the annual meeting of this society, Hartford, Conn., the following officers were elected for the ensuing year: President, H. S. Fuller; vice-president, S. B. St. John; secretary, G. C. Segur; treasurer, C. D. Alton; librarian, E. K. Root. This was the first meeting of this society in its new home, the Hunt Memorial Building.

McDonough County Medical Association.—This association held its fourth session at Macomb, Ill., January 3. Dr. J. J. Parke of Bardolph read a paper on "Therapeutics," J. P. Roark of Bushnell, a paper on the "Use of Drugs in the Practice of Medicine," J. R. Hull of New Hope, a paper on "Asthma," and B. L. Copelan of Colchester, one entitled "A Few General Observations."

Chicago Pathological Society.—At the meeting of this society, January 9, Dr. I. B. Diamond reported cases of amebic dysentery, with microscopic demonstrations of sections showing an improved method of staining. Dr. M. Herzog reported a case of sarcoma of the mesentery, and Dr. T. R. Crowder a case of tuberculosis of the cecum with demonstration.

Tri-State Medical Association.—At the recent meeting of this association at Memphis, Tenn., resolutions were passed acknowledging the indiscriminate sale of morphin by druggists and its use. The association also went on record as favoring stringent legislation along these lines and appointed committees for the States of Arkansas, Mississippi and Tennessee to look after such legislation. The officers for the coming year are: Presidents, E. H. Martin of Mississippi, S. R. Kinney of Tennessee, N. Haase of Arkansas; vice-president for Mississippi, N. W. Alexander of Tunica; vice-president for Arkansas, C. R. Shinault of Helena; vice-president for Tennessee, A. H. Young of Ripley.

Wayne County Medical Society.—At the regular meeting of this society, held in Detroit, Mich., January 5, Dr. M. V. Meddaugh read a paper on "The Menopause." He said that he believed the entrance upon the change of life is perilous to many women, but that in the normal woman, the menopause is passed with no unusual events dependent upon the change; but where there is a lacerated cervix, an erosion, a ruptured perineum or a diseased condition of an organic nature of the organs of generation, such pathologic conditions should receive the prompt attention of a surgeon, else serious results almost inevitably follow. The society discussed the question

of Christian Science healing, a theme that has been stirring the people of Detroit for some time, through the publication in the daily press of the miraculous restoration to integrity of the injured thigh of a prominent clergyman in the city, and the opinions of the physicians who had attended him; also the history of a case of albuminuria in a woman who had recently given birth to a child. Her regular physician had been discharged and a Christian Science healer had been called in. The woman died the same night. The regular physician had refused to sign the death certificate and reported the case to the Health Board for investigation, but the coroner gave a burial permit. Investigation is now in progress relative to the authority of Christian Science healers to sign death certificates, and the power of the coroner to grant burial permits in cases analogous to the one recited.

Kentucky Midland Medical Association.—The twelfth quarterly meeting of this association was held at Lawrenceburg, Ky., January 12, under the presidency of Dr. W. E. Sleet of Midway. Among the papers read were the following: "Eczema," H. H. Roberts, Paris, Ky.; discussion by S. J. Anderson, Midway. "The Art and Mystery of Medicine," B. F. Powers, Lawrenceburg, Ky.; discussion by U. V. Williams, Frankfort, Ky. "Pneumonia," Dr. Hicks, Midway, Ky.; discussion by W. T. Buckner, Shelbyville. "The Curette," by R. D. Pratt, Shelbyville; discussion by J. R. Ely, Frankfort. "The Use of Anesthesia in Labor," E. E. Hume, Frankfort; discussion by C. W. Kavanaugh, Lawrenceburg, Ky.

PUBLIC HEALTH.

First-Aid Boxes on Trains.—The French Government has ordered the railroad companies to install "first aid boxes" in the depots and on the trains, "complying in every respect with the latest progress in therapeutics and modern chemistry."

Prohibits Injurious Coloring Matter in Sausages.—Chapter 193 of the Acts of Massachusetts of 1898 provides that whoever uses, in the manufacture of sausages, any coloring substance injurious to health shall be punished by fine not exceeding $100 for each offense.

Detroit Health Report.—The health report for the city of Detroit, Mich., week ending Jan 7, 1899, gives: Deaths, 88; under 5 years, 23. Births: Female, 25; male, 36. Contagious diseases: Diphtheria 13, new cases 11, recovered 11, dead 2, 11 remaining; scarlet fever 43, new cases 10, recovered 11, 42 remaining; smallpox 5, new cases 1.

Sanitary Condition of Havana.—The *Archives de la Policlinica* of Havana remarks that the official reports sent to our Government by the sanitary inspector, Dr. Brunner, will not be considered exaggerated by any Cuban who has ever traveled, notwithstanding their extreme statements in regard to the filthiness of the city.

Waterproof Uniforms.—The Belgian Government is testing processes to render the uniforms of the soldiers impermeable to water. The process most favored is to dip the cloth in aluminium acetate, and dry in the air without wringing. It has been found that impregnating the material with an aluminium salt does not hinder the cutaneous respiration, nor affect the quality nor the color of the goods.—*Gaz. Méd. de Paris*, Nov. 26, 1898.

Report on Leprosy.—Dr. C. A. Ruggles of California, recently returned from Honolulu, where he has been making an investigation as to the condition of the lepers. In his report to the California State Board of Health, Dec. 26, 1898, he suggests that, for the protection of the State, every person coming from Honolulu, China and Japan, before being allowed to land in California, shall pass a thorough and rigid examination by a competent officer.

Health in Michigan.—The report for December, 1898, gives neuralgia, rheumatism, bronchitis, influenza, and tonsillitis as the five most prevalent diseases during the month. Compared with the preceding month, there was an increase in area of prevalence in pleuritis, pneumonia and influenza, and a decrease in intermittent and typhoid fever. Compared with the December average for twelve years, intermittent, remittent and typhoid fever, diphtheria, consumption, pneumonia and scarlet fever were less prevalent.

Authorizes Incineration.—By act of 1898, any cemetery corporation organized under the laws of the State of Massachusetts may cremate or incinerate bodies of the dead, and may erect, maintain and operate the buildings, appliances and facilities for so doing and for the disposition of the ashes of the dead, on any of its land within the enclosure of its cemetery which the State Board of Health may determine to be suitable for that purpose, and such buildings, appliances and facilities shall be deemed to be a part of the cemetery and to be dedicated to the burial of the dead, and shall be held by said corporations subject to the duties, and with the privileges and immunities which they now have under general laws or by special act or acts.

Yellow Fever Contracted at Night.—A number of convincing instances are related by V. Godinho in a study of yellow fever (*O Brazil Médico*, Oct. 22, 1898), in which persons escaped yellow fever completely by leaving the infected spots before sundown and sleeping elsewhere at night. At Rio Janeiro and S. Paulo, business can be carried on during the day by non-immunes, without danger of infection, if they have their homes at Petropolis or some other suburb. The head of a prominent German business firm at Santos thus passed unscathed through several epidemics, even the epidemic of 1889, but one night found it more convenient to sleep at Santos and contracted the disease that night. Similar instances are constantly being reported. Sanarelli has demonstrated that the bacillus icteroides is destroyed by seven hours' exposure to sunlight. Globig, of the German navy, recently published a communication (*Arch. de Med. Nav.*) stating that while in port at Rio Janeiro, none but the sailors on night duty contracted yellow fever. The popular belief that yellow fever is only contracted after an attack of indigestion, Godinho explains by the fact that the indigestion and fever are the initial symptoms of the invasion of the infection, caused by the efforts of the system to eliminate the toxins.

Malarial Infection: The Mosquito Exonerated.—Several European countries have been devoting much thought of late to the subject of malarial infection, and the Governments of Germany, England, Belgium and Italy have appropriated funds for its scientific study. Germany has the item of $15,000 in its budget for 1899, to defray the expenses of another trip by Koch to Africa. A society for the study of malaria has been organized in Rome, and the members claim to have established the fact that the germs of malarial infection are not transmitted by the common mosquito, the *culex pipiens*, but only by stings from the *anophele claviger*, *calex penicillares* and *culex malariæ*, which infected the subjects in numerous tests with typic tertian estivo-autumnal fever, such as was prevalent in the localities whence the insects were brought (Grassi, Bastianelli and Bignami). Ross also asserted a while ago that the hematozoon of estivo-autumnal fever does not develop in the organism of the *culex pipiens*. Celli and Santori also resumed their experimentation in the line of serotherapy of malarial infection, confirming anew the negative results previously attained. The members of the Society reported research which seems to favor the hypothesis that attributes to the flagella a particularly important rôle in the propagation of the parasite outside the human organism. The crescentic bodies constantly contain chromatin accumulated in

their nuclei, while the flagella present two distinct portions: a protoplasmic and a central portion composed of nuclear substance. The flagella develop by means of the deposits of chromatin in the nuclei of the crescentic bodies and the large undivided bodies of tertian fever. These deposits can be observed swelling, edging toward the periphery and finally stretching out long and assuming the shape of flagella.—*Semaine Méd.*, December 14.

ASSOCIATION NEWS.

Resolutions on the Death of Dr. John B. Hamilton.—At a meeting of the Board of Trustees of the AMERICAN MEDICAL ASSOCIATION, held in Chicago, Jan. 2, 1899, Dr. A. Garcelon, president of the Board, appointed a committee which drafted the following resolutions:

WHEREAS, in the wisdom of Divine Providence our worthy secretary and editor, Dr. John B. Hamilton, a loyal friend, a devout Christian, a great man, has in the prime of his manhood been called from his earthly labors to eternal rest, therefore, be it

Resolved, That the Trustees of the AMERICAN MEDICAL ASSOCIATION desire to express their deep appreciation of a faithful servant, one whose untiring energies in the interests of their JOURNAL have received the recognition of the medical profession of the world,

Resolved, That while his business capacity has been exemplified in all the undertakings of his life, and success had crowned his every effort, notably as a sanitarian, a surgeon, and a surgical teacher, yet, above all, the position to which the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has attained through his efforts marked him as being possessed of superior executive ability and rare editorial genius.

Why weep for him? For him the angels came;
Ere yet his eye with age grew dim, or bent the stalwart frame;
His weapons still were bright, his shield was lifted high
To slay the wrong, to save the right—what happier time to die?

E. E. MONTGOMERY,
JOSEPH EASTMAN,
H. L. E. JOHNSTON,
} Committee.

NECROLOGY.

LOUIS H. SPANNHAKE, M.D., N. Y. University, 1867, died in New York City, where he was long a general practitioner, December 29. He was 58 years of age.

SAMUEL BENJAMIN NICOLL, M.D., College of Physicians and Surgeons N. Y., 1852, died at Shelter Island, Queens County, N. Y., January 4, aged 73 years.

CHARLES W. MCMANUS, M.D., only son of Owen B. McManus, an interne of the Willard Parker Hospital, New York City, died January 5 of pneumonia, aged 22 years.

WILLIAM G. BROWNSON, M.D., N. Y. University, 1865, resident physician of the Soldiers' Home, Norton Heights, Fairfield County, Conn., died January 3. In early life he was a teacher, and subsequently began his medical career in the U. S. Army.

EVERT VANEPPS, M.D., Albany, N. Y., 1881, of Schenectady, N. Y., died there suddenly of cardiac disease, January 7.

LOUIS A. LIVINGOOD, M.D., Jefferson, 1854, died in Womelsdorf, Berks County, Pa., January 4, aged 68 years.

JOSEPH C. GREENE, M.D., Buffalo, N. Y., a graduate of the Albany Medical College, class of 1855, died January 3, aged 70 years. He was an ex-president of the Fourth Branch of the New York State Medical Association, and of the Erie County Medical Society, and was at one time president of the Buffalo Historical Society.

SCOTT OWEN, M.D., Syracuse, N. Y., professor of anatomy in the Syracuse Medical College, died January 3, in that city.

LINCOLN MUSSEY, M.D., Denver, Colo., adjunct professor of anatomy and orthopedic surgery, Gross Medical College; co-editor of the *Western Medical and Surgical Gazette*; member of the AMERICAN MEDICAL ASSOCIATION, and Denver and Arapahoe Medical Society, died in Guadalajara, Mexico, Dec. 28, 1898, of pulmonary hemorrhage. Dr. Mussey was a graduate of the Union Medical College and had studied in Munich and Vienna for a year, and was 32 years old.

C. C. LANG, M.D., Pittsburg, Pa., born in 1848, died in that city January 3. During the Civil War he was hospital steward of the One Hundred and Third Pennsylvania Volunteers, and from April, 1864, to 1865 he was a prisoner of war at Andersonville. After the war he resumed his medical studies and was graduated from the University of Pennsylvania in 1867

JOHN SHUTZ, M.D., Philadelphia, who for many years has been making a specialty of laryngology, whose death was noticed in the JOURNAL, January 7, was a graduate of the University of Pennsylvania, class of 1880, and subsequently completed his medical studies in Vienna. For the past eighteen years he had practiced in Philadelphia and gained considerable distinction. He was a member of the County and Philadelphia Medical Societies, and 40 years of age.

CHARLES F. GUILLOU, M.D., formerly a surgeon in the U. S. Navy, died December 25 at his home in New York. He was born in Philadelphia, July 20, 1813, and was educated in the University of Pennsylvania. After having been assigned to the ship *Peacock* he served in the Mexican War, and afterward became surgeon of the U. S. ship *Columbia*, which went on an extended cruise in Asiatic waters. He was subsequently assigned to the U. S. frigate *Constitution*, and when on one of her cruises in European waters the vessel touched at Gaeta, Italy, Dr. Guillou went with the American consul and the captain of the *Constitution* to visit King Ferdinand II and Pius IX. These personages visited the *Constitution* the next day, when the Pope was taken ill and was attended by Dr. Guillou. The day after Dr. Guillou was sent for by his Holiness, who offered to confer an order on him, but Dr. Guillou, being an American, could not accept. Dr. Guillou, on his return home, was detailed to the Brooklyn Navy Yard, from which service he resigned in 1854 to assume charge of a hospital in Honolulu. While in the Hawaiian Islands he also served as Italian Consul by special appointment of Victor Emmanuel. He remained in Honoluiu until 1867.

E. M. ALVERSON, M.D., Stonington, Ill., Jan. 3, 1899.—H. M. Ayres, M.D., Kensett, Ark., Dec. 21, 1898, aged 60 years.—N. H. Ballard, M.D., Richmond, Ind., Dec. 27, 1898, aged 50 years.—James Webb Booth, M.D., Hartford, Conn., Dec. 23, 1898, aged 54 years.—B. T. Buckley, M.D., Freeport, Ill., Rush Medical College, 1852, January 4, aged 74 years.—B. F. Coffin, M.D., Westfield, Ind., Dec. 29, 1898, aged 82 years.—B. F. Gordon, M.D., Mercer, Pa., Jan. 4, aged 77 years.—Augustus Leininger, M.D., Canton, Ohio, Dec. 30, 1898, aged 39 years.—Charles Austin Merritt, M.D., Charlotte, Mich., Dec. 26, 1898, aged 74 years.—L. P. L. Parker, M.D., Akron, N. Y., January 1, aged 70 years.—J. B. Simpson, M.D., Mountain House, Ark., Dec. 31, 1898, aged 47 years.—A. S. White, M.D., Utica, Miss., Dec. 31, 1898, aged 32 years.

DEATHS ABROAD.

PROF. O. BULHOES, Rio Janeiro, president of the Brazilian Med. Surg. Society, ex editor of *O Brazil Medico*, representative of the Brazilian Government at international congresses, etc.

Dr. GRUBY, one of the celebrities of Paris forty years ago, when this Hungarian Jew was sought after by the most distinguished people as their favorite physician. His methods were eccentric, but based on rational hygiene, dieting and the idea that to win confidence and cure the imaginary ailments of people, their statements must be accepted in all seriousness, and they must be given such a complicated and minute set of orders and prescriptions that they will forget the disease in carrying out the instructions. He was one of the first to make a scientific use of the microscope, which he improved, and he also devised a number of appliances for the care of the wounded.

MISCELLANY.

Health Officer Retires.—Dr. Jas. F. Hibberd, Richmond, Ind., after serving as secretary of the Wayne County Board of Health for the past seventeen years, has retired.

Resignation of Dr. Paul Paquin.—Dr. Paul Paquin has resigned his position as secretary of the State Board of Health of Missouri. He resigned to take charge of a hospital in North Carolina

Health Officer Remembered.—Dr. Larkin Smith, health officer at Nashville, Tenn., was recently presented with a handsome silver tea service by his associates in the city health office.

Oldest Living Yale Medical Graduate.—Dr. Chauncey Ayres of Stamford, Conn., aged 80 years, and said to be the oldest living graduate of the Medical School of Yale University, was recently injured during a fire which damaged his residence. It is believed that his injuries are not fatal.

Dr. Effie Lobdell.—Dr. Effie Lobdell, clinical professor of obstetrics at the Harvey Medical College, Chicago, is said to be the first woman obstetrician to serve on the staff of the Cook County Hospital. She was appointed to the staff January 3.

Foreign Personals.—Professor Ponfick of Breslau is seriously ill from infection contracted during a necropsy . . . Prof. Hans Virchow, son of the celebrated anatomo-pathologist, was bitten by a monkey at the Anatomic Institute, requiring chloroform to suture the injured tendons.—*Progrès Méd.*, Nov. 26, 1898. . . . Prof. P. Knoll has been called from Prague to take the chair of pathology at Vienna, left vacant by the death of Professor Stricker . . . Prof. R. Paltauf has been appointed ordinary professor of general pathology and pathologic histology at Vienna . . . Dr. C. A. Stillwagen of Pittsburg, Pa., left for Berlin, Germany, January 2, where he will take a special course in medicine in the University of Berlin.

Physicians' Golden Weddings.—Dr. and Mrs. J. H. Hollister, Chicago, celebrated their golden wedding January 2. Dr. Hollister is one of the oldest physicians in Chicago, and this was not only the fiftieth anniversary of his marriage, but the fifty-first anniversary of the beginning of his practice in Cook County. He has been president of the Chicago Medical Society, The Illinois State Medical Society, and at one time editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. . . . Dr. George A. Ketchum, the eminent medical teacher and sanitarian of Mobile, recently celebrated his golden wedding anniversary. For years connected with the Mobile Medical College, he is at present its dean. Formerly president of the local board of health, he was largely influential in establishing the city's excellent water-supply, and is an ex-president of the Alabama State Medical Assiciation and member of the State Board of Health.

Department Dinners and Rush Medical College.—Dr. Nicholas Senn, professor of surgery in Rush Medical College, Chicago, recently suggested that from time to time heads of departments in the college hold department dinners, and began this innovation by himself acting as host at a down-town hostelry, to the various associate professors, instructors, etc., connected with the department of surgery at Rush. As far as his department is concerned, Dr. Senn will hold these dinners quarterly. The idea is to bring about a closer fellowship between the instructors and professors of the department and talk over plans for bettering the work. At the recent dinner Professor Senn spoke on the work at the college and made notes of such suggestions as were offered by others present in regard to the work. Dr. Senn and others also spoke feelingly of the late editor of the JOURNAL, whose chair at the banquet table was draped on this occasion.

Medical Department, Vanderbilt University.—This institution is about to establish a library and reading-room for its students, to be used both for study and general reading, and accessible at all times.

The University of Bologna.—This renowned institution of learning, which has fallen so much from its ancient splendor and renown that it is now one of the most backward universities in Italy, chiefly owing to funds, will in all probability soon be in a position to recover some, at least, of its former glory. Professor Baccelli, the minister of public instruction, has promised that during the coming session of the Italian Parliament he will introduce a bill to provide the necessary means for its rejuvenescence.

Medical Department Kentucky University.—The annual session of this institution began Jan. 2, 1899. On Dec. 31, 1898, the following gentlemen, formerly professors in the Kentucky School of Medicine, were elected full professors in Kentucky University, of their respective departments: J. B. Marvin, B.S., M.D., Professor of Principles and Practice of Medicine and Clinical Medicine; J. M. Holloway, A.M., M.D., Professor of Surgery and Clinical Surgery; C. W. Kelly, A.M., M.D., Professor of Anatomy; S. E. Woody, A.M., M.D., Professor of Chemistry and Diseases of Children. Kentucky University celebrated the one hundredth anniversary of its foundation January 1, it originally being Transylvania University.

St. Louis City Hospital.—Dr. John Dean has been appointed acting superintendent of the St. Louis City Hospital. Dr. Dean is a graduate of the St. Louis University and the St. Louis Medical College, and served as an interne in the Hospital in 1896.

New Hospital.—Public opening of the new Burlington (Iowa) Hospital took place January 5. The building is a three-story structure, with basement and with a nurses' house adjoining, and contains twenty-eight rooms.

Cook County Hospital.—At a meeting of the medical staff of the County Hospital, Chicago, January 9, the following officers for the coming year were chosen: President, Francis W. McNamara; secretary, Edward L. Moorehead; chairman of executive committee, J. J. Murphy.

Bequests.—The Lakeside Hospital, Cleveland, Ohio, recently received $25,000 by the will of the late Helen M. Winslow of Buffalo . . . Chester Hospital, Chester, Pa., received $1000 from the late Col. Samuel A. Dyer . . . The Presbyterian Hospital, New York City, received $5000 by the will of the late Mrs. C. L. Marcy.

Henrietta Hospital.—The name of the Protestant Hospital of East St. Louis, Ill., in recognition of an endowment of $10,000 recently received, has been changed to the Henrietta Hospital.

St. Francis Hospital.—The report of the St. Francis Hospital, Freeport, Ill., for 1898, shows that during the year 251 patients were admitted, 43 being in the hospital at the beginning of the year. In addition 87 patients were treated outside of the hospital. The deaths numbered 18 and 54 patients were still in the hospital Dec. 31, 1898.

Against Adulteration of Candy.—A law has been passed in Iowa which provides that no person shall, by himself, his servant or agent, or as the servant or agent of any other person or corporation, manufacture for sale, or knowingly sell or offer to sell any candy adulterated by the admixture of terra alba, barytes, talc, or any other mineral substance, by poisonous colors or flavors, or other ingredients, deleterious or detrimental to health. Whoever violates any of the provisions of this act shall be punished by a fine of from $50 to $100, and the candy so adulterated shall be forfeited and destroyed under the direction of the court.

To Look After Linseed Oil.—Chapter 52 of the Laws of Iowa of 1898 is designed to prevent the adulteration of, and deception in the sale of linseed or flaxseed oil, and to regulate the sale thereof. Section 4 makes it the duty of the State Board of Health to prescribe rules and regulations to enforce the provisions of the act; and any court of competent jurisdiction is authorized, upon application of the Board of Health or its agents, to enjoin the violation of any of the provisions of this act relating to the manufacture and adulteration of linseed or flaxseed oil, which offense is declared to be a public nuisance; the county attorney being required to attend to the prosecution of offenders, upon the application of the State Board of Health.

Pneumococcus Peritonitis.—A case is reported, diagnosed as an osteomyelitis of the head of the femur, and operated, when it was found that the pus came from the abdominal cavity. A similar abscess occurred later on the other thigh with the same cause. An abscess also formed on the right arm and knee. The pneumococcus was found at each incision. Recovery.—*Presse Méd.*, Dec. 7, 1898.

Local Alterations in Acute Infections.—E. Walger states his conviction that the local anatomic alterations peculiar to various acute infective diseases, and hitherto accepted as the essential manifestation of the affection, are in fact the characteristic means of eliminating the bacterial toxins, similar to what occurs through the urine, sweat and fecal discharges. The localization peculiar to each disease is evidence of the specific character of the disease germs and of its toxins.—*Cbl. f. In. Medicin*, 1898, No. 49.

Streptococcus and Pneumococcus Osteomyelitis.—Lexer reports a number of large phlegmons of the bone marrow with extensive sequestration, caused by the streptococcus. The bright, rather greenish color of the thin pus was noticeable, also the dirty-looking discoloration of the inflamed marrow. One case of streptococcus pyemia had localizations in the bone as well as other metastases. In seven cases of streptococcus osteomyelitis the suppuration of the articulations were the predominant lesions. The patients were all children from 3 weeks to 2 years old. The prognosis is good with vigorous children. He also observed a group of cases of suppuration in the articulations without any primary affection of the bones; these were the lightest cases. A case of pneumococcus osteomyelitis resembled in every respect the inflammation of a joint resulting from the breaking through of a streptococcus bone focus. A second case presented a serous effusion in the left knee, subsiding with rest, but followed later by an abscess in the region of the trochanter.—*Munich Med. Woch.*, Dec. 20, 1898.

Foramina of Majendie and Luschka.—A. Cannieu has been investigating the brains of vertebrates, including man, and announces that in the fresh brain the foramen of Majendie and Luschka's holes have no existence. When found they are always caused by postmortem changes, as absolutely fresh brains seldom come to the necropsy. The cephalorachidian fluid evidently passes, by osmosis, from the ventricular cavities into the subarachnoid spaces.—*Presse Méd.*, Nov. 26, 1898.

Paralysis of Peritonitis.—Van Arsdale (*Annals of Surg.*, January, 1899) suggests a further development of "intestinal drainage," in this condition, by direct and continued openings into the intestine, i. e., the establishment of one or more intestinal fistulæ. The openings should be made longitudinally, greatly facilitating their spontaneous closure, and they may be used for introducing medicines or restoratives, where some intestinal function is present.

A Strange Suicide.—A short time ago a man in Vienna committed suicide by placing a large quantity of gunpowder in his mouth and then setting fire to it. When taken into a hospital he was still conscious. He complained of a severe pain in the left side, and asked for a drink, but could not swallow it, and died in twelve hours. At the autopsy contusions were found on the mucous surfaces of the tongue and mouth, lacerations of the throat, esophagus, and alveoli of the lungs, and interstitial emphysema of the latter.

Identification by the External Ear.—Miss M. A. Ellis recently contributed a paper on the human ear as a means of identification, to the British Association for the Advancement of Science, and pointed out that the helix, or outer rim of the ear, and the general shape of the pinna, or whole outer ear, were the most useful for purposes of identification. Ears do not change shape after childhood, although they enlarge slightly after middle life. From the varieties of sixty-four pairs of ears, many belonging to individuals noted in art, science and literature, printed from life by Miss Ellis, it has been found that the right and left of each pair of ears usually vary in shape.

Behring vs. Calmette.—Dr. Calmette, Pasteur's well-known pupil, who was recently appointed as chief organizer of the Pasteur Institute at Lille, and who has won much fame by his researches into the question of immunity for serpent venom, has made another discovery of a more purely commercial nature. By this discovery he was enabled to manufacture alcohol very much purer and stronger than is usual at a distillery and at the same time much more cheaply. He sold his secret to a large factory near Lille and very soon realized the handsome sum of 250,000 francs. This he has handed over absolutely to the Pasteur Institute, over which he presides, although he is not personally a wealthy man. This act of munificence, which has been noticed solely by the medical press and ignored by the political journals, is considered as a protest against the recent action of Dr. Behring.—*Lancet*, Nov. 5, 1898.

Turpentin in Tuberculosis.—Richet and Hericourt had three dogs, previously inoculated with tuberculosis, inhale turpentin vapors for an hour every four or five days, with the result that two are still alive, nine months later, while the control animals all died in about thirty-five days. Hénocque thinks there is a decided therapeutic value in the ozone generated in turpentin vapors.—*Paris Soc. de Biologie*, Nov. 12, 1898.

Phlyctenular Ophthalmia.—Michel asserts that the vesicles are the "reaction lesion of the organism to microbes invading the cornea," and that the affection is exclusively parasitic. The staphylococcus was most frequently encountered in cultures from the vesicles; animals inoculated presented the same characteristic lesions. The lesion in man is not limited to the subepithelial space in the cornea, but is accompanied by superficial infiltration of the corneal tissues.—*Anales de Oftalmologia*, December, 1898.

Respiration of the Amphibia.—Ottolenghi asserts that the cutaneous respiration of the amphibia is very active and aids the gastro-intestinal respiration in keeping the animals alive when in the water, and deprived of pulmonary respiration, if the skin and mucosa are in contact with continuously fresh water, which supplies the oxygen and sweeps away the products of elimination.—*Gaz. degli Osp.*, Nov. 6, 1898.

Etiology of Functional Neuroses.—Luxenburg has confirmed Biernacki's statements in regard to the abnormal amounts of fibrin and fibrinogen in the blood of hysterics and neurasthenics (vide JOURNAL, XXX, p. 392) shown in the spontaneous sedimentation. They consider functional neuroses, therefore, another manifestation of disturbed oxidation processes, such as we have in gout, diabetes, rheumatism, etc., especially hysteria with chronic intoxication from morphin, metritis, abortion, angina, infective diseases, etc. "The so-called functional neuroses are not a primary affection of the central nervous system, but a secondary symptom-complex resulting from the effect on the nervous system of the products of primary abnormal oxidation processes. Hysteria and neurasthenia therefore derive from

the diathesis produced by a congenitally defective condition of the oxidating apparatus."—*Neurol. Cbl.*, 1898, No. 6.

Incitements to Professional Unity.—There is no absence of peace in the ranks of the medical profession of New Orleans and Louisiana. There are probably fewer bickerings and factional difficulties among our doctors than among those of any other State or large city. Yet union, which should be concomitant with peace, is wofully lacking. We mean that union which leads to organization and produces strength and purpose. The brains, education and working capacity of the individual physicians are such that collectively they should wield an immense influence for the public good and be amply able to protect themselves against infringements on their field of labor. Not being organized, they do neither, as is attested by the results of their efforts before legislative bodies and by the numerous impositions with which the appreciative public burdens them. This lack of organization is due in large part to short sightedness and selfishness. The older men in the profession, those who have achieved distinction and the attendant recompense, seem frequently to care little what may befall their brethren. What time have they to attend meetings or labor for the common good—have they not what they want? The younger men, those who are contesting for a place, with such an example before them, seize all the opportunities which tempt them by a temporary benefit, losing sight of the fact that they may be harming the best interests of the profession and that they are damaging the prospects for their own future.—*New Orleans Med. and Surg. Jour.*, December, 1898.

Development of the Uterus.—F. v. Friedländer concludes from a study of 161 uteri from the embryo to early puberty, that the cervix develops first. After the fifth year, the fundus and the ovaries develop. In early life certain peculiar, villus-like papillæ are found around the orif. int., which he is the first to describe. These may prove sufficient to arrest the outflow of mucus and even render the menstrual flow difficult. In certain cases of dymenorrhea not due to an endometritis, the persistence of an infantile form of development may be inferred.—*Munich Med. Woch.* from *Arch. f. Gyn.*, lvi, 3.

Indianapolis Board of Health.—At a recent meeting of this Board a number of changes were made in the City Hospital staff. The work on genito-urinary diseases will hereafter be divided between Dr. Sutcliffe and Dr. Wisnard, and the work in Surgery between Drs. W. V. Morgan, W. M. Wright, C. O. Durham, and J. H. Oliver.

Sanitation in Tuberculosis.—The above title is one recently treated by Dr. Luther M. Halsey of Williamstown, N.J. Dr. Halsey refers to an editorial in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, in which statistics were given from twenty of our principal cities with a population of 7,500,000, showing that there has been a decrease of the death-rate from tuberculosis amounting to 33 per cent. since 1888, which has been ascribed to the more general knowledge concerning this disease. The paper shows that since 1838 the number of deaths from smallpox has been reduced 96 per cent. Since 1881 typhus fever has been reduced 95 per cent., and typhoid fever 60 per cent. Since 1860 scarlet fever shows a decrease of 81 per cent. and tuberculosis a decrease of 46 per cent. "The general effect of improvement of sanitation is that 600,000 persons reach the age of 21 years who sixty years ago would have died." Regarding the prevention of tuberculosis, the writer advocates the adoption of sanitary laws by boards of health of different States, the destruction of sputa from those infected, the regulation of school-houses and the establishment of hospitals for the proper care and treatment of consumptives.

Experimental Research with Tuberculosis.—Sabrazés has experimentally established that tannin has no effect upon the course of tuberculosis. Fowls have been infected with human tuberculosis in some recent experiments in which horse serum was injected into the peritoneum at the same time, thus "manmalizing the animal as it were." Injections of bacilli into the liquor cerebrospinalis produced prompt, fatal tuberculous meningitis in guinea-pigs, and the same results were also attained with injections of the filtered toxins.—*Munich Med. Woch.*, Dec. 20, 1898.

New Publications.—Bearing the date, December 1898, Vol. i, No. 1, of a new monthly record of medicine and surgery, the *Medical Dial*, has been received. It is published at Minneapolis, Minn., at $1.00 a year.

Correction in Curare Dose.—In an item entitled "Curare in Epilepsy" (vide JOURNAL, Jan. 7, 1899, p. 29), the dose of curare was given as, practically, one-sixth grain injected once every five days, an error as the extreme dose of curare, hypodermically, could hardly safely exceed .5 grain.

Philadelphia.

BEQUESTS.—The third distribution of money left for charitable purposes by the late Mr. Simon Muhr has been made this week as follows: To the Jewish Hospital, $7000; Jewish Foster Home, $4200; Pennsylvania Hospital, $1400; Jefferson Medical College, $1400; Philadelphia Home for Incurables, $1400; Philadelphia Polyclinic Hospital, $700; Children's Hospital, $560; Women's Hospital, $560; West Philadelphia Hospital for Women, $280; Sanitarium Association of Philadelphia, $1400; Old Ladies' Home of Philadelphia, $280; Philadelphia Lying-in Charity, $560. Bequests from the same fund have also been made to other charitable institutions.

SMALLPOX.—Dr. Benjamin Lee, secretary of the State Board of Health, has made the following report in regard to smallpox in Pennsylvania: In Bedford County, 1 case is reported at Ball Hill, 3 at Everett, 3 at Hopewell, 11 at Stulton; in Fulton County, Hustontown, 4 cases, New Grenada, 7, Waterfall 1; East Vincent Township, Chester County, 1; Pittsburg, 1; Homer City, Indiana County, 2 cases. The disease is also reported at Sibonia, Franklin County, Warfordsbury and Wells' Tannery, Fulton County, diagnosis not confirmed.

OVERWORKED DRUGGISTS.—The statement of an officer of the New York Druggists League that "upward of one hundred persons are fatally poisoned in New York every year through the practice of druggists substituting one drug for another either by mistake, or to increase profits," has been unfavorably commented by Prof. J. P. Remington of this city. It is the expressed opinion of Professor Remington that but comparatively few mistakes made by druggists occur in Philadelphia and that possibly not more than one death therefrom occurs annually. What few mistakes were made he thought were soon found out and promptly published. So far as the substitution of one drug for another, for profit, is concerned, the reputable druggist does not dare do it. Of drugs which may be substituted for one another it was thought that acetanilid may be represented as phenacetin. There seems to be a diversity of opinion regarding whether or not the long hours of druggists lead to mistakes in compounding prescriptions.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.—At the last meeting of this institution, Dr. John B. Deaver read an interesting paper on "Abdominal Injuries." He referred to a number of cases in which the intestines and stomach had either suffered from injury or the seat of disease. In cases of intestinal anastomosis he had resorted to the end-to-end anastomosis, with apparent good results, and is gradually leaving off the use of all forms of mechanical appliances in anastomosis, much depending upon the needle and thread. Dr. Taylor, on being requested to speak on the subject, coincided in the views as expressed by Dr. Deaver, and also thought mechanical appliances might do harm by being retained. If anything other than needle and thread was to be used, he preferred the instrument recently devised by Dr. Ernest Laplace, which consists of a double pair of forceps joined together to be used in

approximating the two ends of the gut while the stitches are being put in position.

REPORT OF EPISCOPAL HOSPITAL.—The report of the Episcopal Hospital for the year just closed, gives the number of patients in the hospital at the last report, 271; number treated during the year, 3035. Of these, 2746 were discharged, 1974 cured, 415 improved, 88 unimproved and 271 died.

VITAL STATISTICS OF 1898.—As has been stated in a previous issue of the JOURNAL, the number of deaths during the year 1898 were 23,790, an increase of 1055 over last year. Of this number, 5036 were children under one year of age. Compared with last year there was an increase of diphtheria, 233 cases; tuberculosis, 202 cases; heart disease, 102 cases; suicide, 22 cases. Inquests were held in 3490 cases. During the year 22 homicides were reported. During 1898 there was a decrease of pneumonia, 291 cases; cancer 18; influenza, 2, and scarlet fever 168 cases. The total number of deaths from typhoid fever during 1898 was 629 as compared with 401 during the previous year. This latter includes 73 soldiers brought to the various hospitals of the city from army camps. One of the dailies has made an unfavorable comparison with the record of our sister city New York. In 1898, in Philadelphia, there were 639 deaths from typhoid fever, while during the same period there were, in Greater New York with three times the population, only 671 deaths from that disease. The number of deaths ascribed to diphtheria in Philadelphia during 1898 were 998 and in Greater New York, 1461. The 1898 death rate for Philadelphia was 19.18as compared with 19.70 for New York proper and 19.21 for Greater New York.

UNIVERSITY OF PENNSYLVANIA STATISTICS.—The data recently compiled for the forthcoming catalogue shows a total of 2790 students. The geographic distribution of students shows that forty States and territories are represented, thirteen countries and islands of the western hemisphere. Of the total number of students, 1947 are resident in Pennsylvania. Next to Pennsylvania, New Jersey sends the largest number, while New York ranks next with 114. Ten European countries are represented as follows: England, 3; France, 6; Germany, 11; Holland, 1; Ireland, 1; Russia, 3; Scotland, 2; Sweden, 1; Switzerland, 4; Austria, 1. Of the thirteen countries and islands of the western hemisphere the following are tabulated: Cuba, 6; Porto Rico, 1; Brazil, 2; Ecuador, 2; Nicaragua, 5. Africa sends 1, Hawaii 1, Australia 5, and China 2.

LOSS TO UNIVERSITY HOSPITAL,—By the will of Mrs. Mary Ruth, who died some time ago, a bequest of $5,000 was made to the University of Pennsylvania Hospital and the remainder of her estate to the Home for Incurables, of New York. On the same date a codicil was made revoking the latter bequest and bequeathing the property to Emeline College. The court held that the designation of the home in the codicil was incorrect and that the intention of the testator was to divert the bequest made to the University Hospital to Mrs. Colville. The above decision has just been made by Justice White of the United States Supreme Court.

JEWISH MATERNITY HOME.—According to the report of the above named institution, 105 patients have been treated in the home during the past year without a fatality, and in the tri weekly clinics 1286 patients have been treated. The contributing membership had become 346and the subscribing membership 344. The receipts for the year were $6,393.41, and the expenditures $5,633.30, but instead of a balance being left there was a deficit of $2,206.26.

BEQUEST TO PENNSYLVANIA HOSPITAL.—The will of L. Taylor Dickson, a prominent attorney of this city, and who recently died in Georgetown, N. C., disposes of an estate valued at $100,000 and upward. After making minor bequests to relatives the following bequest is made to the Pennsylvania Hospital: "After the death of the five beneficiaries under this will I direct my executors to pay over unto the contributors of the Pennsylvania Hospital the principal and accumulated incomes of my estate. The total principal is to be invested and the income thereof to be used for the support of the patients of the said Pennsylvania Hospital."

PHYSICIANS TO OUTDOOR POOR.—At the last meeting of the Bureau of Charities and Corrections of this city, the physicians to the Outdoor Poor were not appointed for the present year, owing to the fact as stated by Secretary Neall, that all such appointments come under the civil service rule. Druggists have been informed by William H. Lambert, president of Bureau of Charities and Corrections, that all prescriptions given out by that department will be honored when due.

APPOINTMENT.—Owing to the resignation of Dr. William J. Sharpless, physician to the Chester County Prison, Dr. Joseph Scattergood was appointed to the vacancy. Dr. Scattergood is an ex-resident physician to the Pennsylvania Hospital and a graduate of the University.

SKIAGRAPHY REVEALS RING.—Recently a child swallowed a ring and, after the usual methods had been adopted for its removal, was taken to the St. Joseph's Hospital, where skiagraphy revealed the foreign body in the stomach. Subsequently, during a spell of vomiting, the ring was ejected with the vomitus.

CORONER'S INQUESTS DURING 1898.—During the year just closed the coroner reports the total number of inquests as 3490 (*Bulletin*). The number of suicides was large, 183. The following methods prevailed: Arsenic, 19; carbolic acid, 14; cutting throat, 11; drowned, 14; hanging, 34; gas, 19; laudanum, 19; jumping from windows and fire-escapes, 10; shooting, 48. The trolley-car caused the death of 26 persons during the year, and hot weather during the last summer was responsible for 74 deaths. Three were killed by lightning and nine died from electric shock.

PHILADELPHIA POLYCLINIC APPOINTMENTS.—The trustees of the Philadelphia Polyclinic recently appointed Dr. Francis R. Packard to the office of dean of the college departmrnt. Dr. Packard is a graduate of the University of Pennsylvania and at present laryngologist and otologist to the Pennsylvania Institution for the Deaf and Dumb, and physician to the outpatients of the University Hospital. Dr. Thomas S. Kirkbride, also a graduate of the University of Pennsylvania (1893), has been appointed director of the laboratories. Dr. Kirkbride is an ex resident physician to the Pennsylvania Hospital and has just returned from a post-graduate course in Europe.

COLLEGE OF OSTEOPATHY.—Attorney-General Henry C. McCormick has filed exceptions to the granting of a charter for the Philadelphia College of Osteopathy on behalf of the College and University Council of Pennsylvania. The following are cited as the exceptions: 1. Because the said application has not been passed upon by the College and University Council of Pennsylvania, nor has such application received the approval of said Council or any official thereof. 2. Because the capital stock of the proposed corporation amounts to only $25,000, and so far as said Council is informed, the said proposed institution does not own or possess assets amounting to $500,000 invested in buildings, apparatus and endowment for the exclusive purpose of providing instruction, as required.

MORTALITY STATISTICS.—The mortality of the city is still high, doubtless on account of the serious epidemic of grippe which still prevails to a large extent. The number of deaths reported for the week ending January 7, were 713, a decrease of 12 over the preceding week, and an increase of 251 over the corresponding period of last year. Of this number there were 55 deaths from influenza as compared with 68 last week; 168 deaths were due to pneumonia, an increase of 23 over last week; from heart disease there were 37, a decrease of 11.

ETIOLOGY OF LA GRIPPE AND ITS COMPLICATIONS.—Since the outbreak of the present epidemic of grippe in this city, several weeks ago, and since the disease has spread with alarming

rapidity throughout the State at large, in many instances being so severe as to close entire schools and colleges, the main subject which seems to engage the attention of the people at the present time is in regard to the etiology, prevention and complications. All agree that the disease is infectious, and while a few are not so bold as to declare its contagiousness, yet it may be stated that the majority hold to this belief. Regarding its prevention, several have advocated plans, but in most cases in which these means have been resorted to proved ineffectual. The fatal diseases which may be traced to grippe and as proved by the mortality statistics of the Board of Health, are pneumonia, heart disease, asthma, bronchitis, nephritis, hysteria, and nervous diseases in general. Its influence upon the production of appendicitis has been discussed by several physicians, including Dr. John B. Deaver and Dr. J. M. Anders, both of whom maintain that attacks of appendicitis may be directly traced to the attacks of la grippe, which sets up a catarrhal inflammation of the bowels involving the vermiform appendix and thus giving rise to the disease. One physician held to the belief that previous to the epidemic of la grippe in 1890, appendicitis was a comparatively rare disease, but since that time cases have continually become more common. Since that date the deaths from pneumonia and heart disease have increased 25 per cent. During this epidemic the prevailing form has assumed the respiratory type, producing a severe dry, hacking cough, and, as has been previously mentioned, no rales can be heard in the chest, evidently showing its limitation, in some instances at least, to the upper respiratory tract. The following statistics in regard to the disease have been made public, the number of fatal cases being as follows: 1890, 147; 1891, 304; 1892, 265; 1893, 139; 1894, 311; 1895, 229; 1896, 79; 1897, 160. While its effects are still noticeable, as shown by the mortality statistics, it may be stated that at the present time (Dec. 31, 1898) the epidemic is gradually abating.

Bequest to German Hospital.—The will of Paul Jagode, in which there is a made "a bequest of $5,000 in trust for the benefit of Quicko Thomas, a poor and pitiable epileptic," has recently been admitted to probate, and on his death the bequest will revert to the German Hospital for the maintenance of a free bed, to be designated, if agreeable to the managers of the said institution, in memory of Pauline C. Jagode.

State Board of Medical Examiners.—A meeting of the State Board of Medical Examiners was held in this city this week, for the purpose of granting certificates to those who were successful in passing the examination held some weeks ago. At this examination 103 candidates presented themselves. Of this number, 71 were granted certificates, 29 failed and 33 were expelled for copying.

Report of National Relief Commission.—Mr. George C. Thomas, Treasurer of the National Relief Commission, acknowledges receipt of the following contributions through the banking house of Drexel & Co: Cash previously acknowledged, $79,617.77; cash, $1,116.00; value of supplies received to date, $40,345.00; grand total cash and supplies, $121,078.77.

Changes at Pennsylvania Hospital.—On January 1, there will be several changes among the officials composing the staff of the Pennsylvania Hospital. The chief resident physician, Dr. J. Clinton Starbuck, has resigned and will go to Boston to a private practice in that city. He will be succeeded by Dr. W. F. Stewart. The term of Dr. Robert Downes has also been completed, and he will establish himself in private practice. Dr. Torrence will succeed Dr. Downes.

Physician to be Prosecuted.—Owing to the severe epidemic of diphtheria which has prevailed for some time in one of the northern districts of the city, the Board of Health has placed the blame upon a physician practicing there, and he has been ordered prosecuted for stating that no contagious or infectious disease existed in that locality (Nicetown). This summary action has been instituted on account of the physician issuing a certificate admitting a pupil to one of the parochial schools before the germs had disappeared from the throat, and it is thought the return of this patient to the school caused the outbreak of the disease, and resulted in the closure of the school for the period of twenty days.

Assistant City Medical Inspector.—Through the Director of Public Safety, Dr. John P. Devereux, of 1911 Pine Street has been appointed an assistant medical inspector in the Bureau of Health, the appointment beginning on Jan. 1, 1899.

Jefferson Medical College.—Members of the class of '71, Jefferson Medical College, celebrated the twenty-seventh anniversary of their graduation by giving a dinner at the Bellevue Hotel on the evening of Dec. 10, 1898. The presiding officer was Dr. L. Webster and the principal speaker Dr. Lambert Ott, on "The Physician as a Factor in Government."

Smallpox Still Spreading.—Owing to the condition of affairs which have been allowed to exist around the county of Bedford previous to the first visit of Dr. W. B. Atkinson, who first diagnosed the disease, the citizens of that community and surrounding county are threatened with a serious epidemic of smallpox. From the fact that several new cases had been reported to the State Board of Health, Dr. Atkinson was again sent to the infected district. His report to the State Health Officer of this city, Dr. Benjamin Lee, was to the effect that little was being done by the practitioners in that vicinity to prevent the disease from spreading and that a grave state of affairs existed. Regarding his trip Dr. Atkinson stated: "That he had been toured through the infected district in a wagon and upon one occasion found a schoolteacher, who had unmistakable signs of the disease, on his way to school to teach. The physician in attendance upon this patient denied that the disease was smallpox, and it was with difficulty that the affected person was restrained from teaching." It is feared that local outbreaks may occur in many portions of the State and to that end a building in this city is being fitted up for the treatment of those affected. In the meantime an inspection is being made in the counties of Bedford, Huntington and Fulton.

Appropriations by City Council.—During the week just passed, city councils passed the appropriations looking for the health and welfare of the city for the coming year. The appropriations are as follows: Bureau of Health, $208,640; Bureau of Street Cleaning, $904,820; Dept. of Charities and Corrections, $500,308; Bureau of Water, $1,264,439. No definite action was taken on water filtration, the most important item brought before council.

Declared Free of Debt.—According to the *Bulletin*, a petition was presented in the orphans' court by three of the four executors of the estate of Dr. William Pepper, to relieve his real estate from lien of any debts. It was stated that Dr. Pepper left personal property, the inventoried value of which is in excess of $500,000; that there are no debts of record against him and there are just and reasonable grounds for believing that all debts not of record left by the testator have been paid in full by the petitioners. Dr. Pepper, it is further stated, owned the premises at 2017 Rittenhouse Square, which the petitioners desire to sell under the power of sale in the will, free and clear of the lien of decedent's debts not of record. Judge Ashman made a decree that the real estate mentioned shall be held and enjoyed free and clear of any lien or debts not of record of Dr. Pepper.

Last of the Sick Soldiers in the Hospitals.—After several months of careful treatment of the sick soldiers brought to the different hospitals of this city, it is stated that very few now remain in these institutions.

Mortality Statistics During Year.—Apoplexy, 840; nephritis, 463; cancer, 670; casualties, 467; cholera infantum, 1099; tuberculosis, 2590; homicide, 22; inanition, 592; influenza, 158; old age, 958; paralysis, 434; suicide, 165; uremia, 428; membraneous croup, 156; diphtheria, 998; heart disease,

1398; dysentery, 95; erysipelas, 50; scarlet fever, 114; typhoid fever (including 73 soldiers at hospital) 639; bronchitis, 435; peritonitis 264; marasmus, 815; measles, 234; rheumatism, 69; sunstroke, 147; whooping-cough, 162.

MORTALITY STATISTICS AND LA GRIPPE.—The number of deaths shows a considerable increase over last week, there being a total of 725, 75 more than last week or an increase of 264 over the corresponding period of last year. There were 68 deaths from influenza, as compared with 29 last week; old age 47, as compared with 34 last week; heart disease 48, an increase of 10 over last week; pneumonia 137, as compared with 123 over the previous week. Of the total number of deaths 176 occurred in children under the age of five years. While persons of all ages have suffered from the effects of the grippe the number of deaths among the aged during the past week or ten days has been quite notable, fourteen deaths having occurred in one day in persons over the age of 70 years.

THE PUBLIC SERVICE.

Movements of Army Medical Officers.—To Manila, P. I.: Capt. George D. De Shon, asst.-surgeon U.S.A. from Washington Bks., D. C., to Ft. Sheridan, Ill., to accompany the Fourth U.S. Infantry; Lieut. R. P. Strong, asst.-surgeon U.S.A., and brigade Asst.-Surgeon Isaac W. Brewer to Ft. Crook, Neb., to accompany the Twenty-second U.S. Infantry; Acting Asst.-Surgeon Burke L. Johnson from Ft. Thomas, Ky., to Ft. Leavenworth, Kan., to accompany the Twentieth U.S. Infantry. To accompany the 17th U.S. Infantry from Columbus Bks., Ohio, Acting Asst.-Surgeon Edward W. Pinkham from duty at the Josiah Simpson Hospital, Va.

To Cuba: Major William C. Gorgas, brigade surgeon, from duty at Santiago to Havana, to establish and take charge of a general hospital at that place; Major John J. Archinard, brigade surgeon, to Havana, to take charge of a hospital to be established for the employes of the quartermaster's department. To Las Tunas, Acting Asst.-Surgeon Joaquin L. Duenas, reporting to Brig.-Gen. Simon Snyder. To Pinar del Rio, Acting Asst.-Surgeon Stephen M. Gonzales, reporting to Brig.-Gen. Geo. W. Davis. To Havana, Acting Asst.-Surgeon Chas. E. C. Peyton from Washington, D.C., for duty with the 7th Army Corps. To Havana, to report to Maj.-Gen. John R. Brooke for assignment, Acting Asst.-Surgeons D. T. Laine and Rafael Echeverria. To Santiago, Lieut. Jas. R. Church, asst.-surgeon U.S.A. from Washington, D.C. To Cienfuegos, Acting Asst.-Surgeon Juan J. Casanova from duty at Santiago.

To special inspecting duty: Col. Chas. R. Greenleaf, asst. surgeon-general U.S.A., to Greenville, S. C., and such other places as may be necessary.

To duty with the 2d Army Corps, Augusta, Ga.: Acting Asst.-Surgeons Molyneux Turner and Elbert E. Persons.

To the 4th Army Corps, Huntsville, Ala.: Acting Asst.-Surgeon John M. Goltra.

To the 7th Army Corps, Savannah, Ga.: Major Wm. S. Bryant, brigade surgeon, to the 2d from the 1st brigade, and Major Francis C. Ford, brigade surgeon, to the 1st from the 2d brigade.

To duty with specified regiments: Lieut. Thos. S. Bratton, asst.-surgeon U.S.A., to the 3d U.S. Cavalry at Augusta, Ga.; Lieut. Frank P. T. Logan, asst.-surgeon 8th Mass. Infantry, to his regiment, from duty at the John Blair Gibbs Hospital, Lexington, Ky.

To duty at posts: To Washington Bks., D. C., Capt. Wm. F. Lippitt, Jr., from the general hospital, Ft. Myer, Va. To Ft. Snelling, Minn., Acting Asst.-Surgeon Chas. E. MacDonald from duty with the 3d Wis. Infantry. To Ft. Niagara, N. Y., Major Wm. J. Wakeman, brigade surgeon, from Columbus Bks., Ohio. To Ft. Crook, Neb., Capt. John S. Kulp, asst.-surgeon U.S.A., from Ft. Niagara, N. Y. To Ft. D. A. Russell, Wyo., Major Marlborough C. Wyeth, brigade surgeon, former orders to Ft. Sill, Okla., having been revoked. To Ft. Douglas, Utah, Major Henry P. Birmingham, brigade surgeon, from the Dept. of Porto Rico (orders subsequently revoked). Lieut. Eugene H. Hartnett, asst.-surgeon U.S.A., and Carl H. Anderson, acting asst.-surgeon, to Ft. Mactone, Wis.

Relieved from post duty: The following officers are now formally relieved from the stations at which they were serving when the outbreak of the war called for their assignment to active service: Lieut. Guy C. M. Godfrey, asst.-surgeon U.S.A., now on duty at Huntsville, Ala., relieved from station at Ft. Delaware; Asst. Major Peter R. Egan, brigade surgeon Vols., now on duty at Ponce, P. R., from station at Ft. Hamilton, N. Y. Major Wm. C. Gorgas, surgeon U.S.A., now on duty at Havana, Cuba, from station at New York City as attending surgeon. Lieut. Jas. M. Kennedy, asst.-surgeon U.S.A., now on duty with the 7th Army Corps, from station at Ft. Washington, Md. Maj. Wm B. Davis, surgeon U.S.A., now on duty commanding the U.S. general hospital, Ft. Myer, Va., from station at Ft. Brady, Mich. Lieut.-Col. Robert M. O'Reilly, chief surgeon Vols., now on duty at Havana, Cuba, from station at Ft. Wayne, Mich. Capt. Benj. Munday, asst.-surgeon U.S.A., now at Richmond, Va., from station at Ft. Wayne, Mich. Major Chas. E. Woodruff, brigade surgeon Vols., now on duty at Manila, P. I., from station at Jackson Bks., New Orleans, La. Major Paul Clendenin, brigade surgeon Vols., now on duty at Havana, Cuba, from station at Key West, Fla. Capt. Robert S. Woodson, asst.-surgeon U.S.A., now on duty at Holguin, Cuba, from station at Ft. McPherson, Ga. Major John L. Phillips, brigade surgeon Vols., from station at Alcatraz Island, Cal.

To general hospitals: To Savannah, Ga., Major Daniel M. Appel, surgeon U.S.A., from duty in connection with the care of soldiers in New York civil hospitals to the supervision of the construction and subsequent command of the general hospital at Savannah.

To hospital duty: To the general hospital, Ft. McPherson, Ga., Lieut. Samuel M. Waterhouse, asst.-surgeon U.S.A. from Ft. Logan H. Roots, Ark. To the general hospital, Savannah, Ga., Major Wm. P. Kendall, brigade surgeon Vols., from Camp Poland, Knoxville, Tenn.; Acting Asst.-Surgeon W. H. Reynolds from duty in Santiago, Cuba. To the Josiah Simpson Hospital, Va., Acting Asst.-Surgeon Jas. H. McCall from Washington, D.C.

Leave of absence granted or extended: Major Wm. R. Hall, surgeon U.S.A.; Major Donald Maclean, chief surgeon Vols.; Major David C. Peyton, brigade surgeon; Major Keating Baudny, surgeon 6th Miss. Infantry; Major Charles R. Parke, brigade surgeon Vols., from 3d brigade, 2d division of the 2d Army Corps; and Acting Asst.-Surgeons E. A. Romig, Elmer A. Doan and José M. Delyndo.

Sick leaves granted or extended: Major Wm. H. Daly, chief surgeon Vols.; Major Hiram Thomson, surgeon 3d Conn. Infantry; Major Geo. E. Lyon, 3d U.S. Vol. Engineers; Capt. J. W. McDonald, asst.-surgeon 4th Tenn. Infantry; Lieut. Lewis A. Griffith, asst.-surgeon 2d S. C. Infantry; Lieut. Geo. H. Jones, asst.-surgeon 10th Ohio Infantry; Lieut. John W. Cox, asst.-surgeon 6th U.S.V. Infantry, and Acting Asst.-Surgeon Henry P. De Forest.

Retired: Lieut.-Cols. Johnson V. D. Middleton and Wm. D. Wolverton, deputy surgeons-general U.S.A.

Resigned: Major Keating Baudny, surgeon 6th Miss. Infantry; Lieuts. John F. Dunshie, asst.-surgeon 9th U.S.V. Infantry, and Chas. S. Sunday, 23d Kan. Infantry.

Honorably discharged: Major Bial F. Bradbury, brigade surgeon; Major Henry P. Birmingham, capt. and asst.-surgeon U.S.A. (his volunteer commission only); Major Wm. H. Daly, chief surgeon Vols., to take effect Jan. 18, 1899; Major Donald Maclean, chief surgeon Vols., to take effect Feb. 28, 1899, and Lieut. F. D. G. Harvey, asst.-surgeon 23d Kan.

Contracts annulled: John H. Grant of Washington, D. C., Thos. Y. Aby of New Orleans, La., and Harry Street of Baltimore, Md., from duty at the general hospital, Ponce, Porto Rico.

CHANGE OF ADDRESS.

Bartine, W. W., from Zearing to Goldfield, Iowa.
Brannan, C. S., from 1001 Madison St. to 888 Clifton Park Av., Chicago.
Brown, G. J., from Gualala to Point Arena, Cal.
Fitch, S. P., from Orange, N. J., to 14 Prospect St., East Orange, N. J.
Griggs, A. F., from West Point to Prudential Bldg., Atlanta, Ga.
Hexter, Stephen, from 199 Fifth Av. to 199 Market St., Chicago.
Kenefick, T. A., from Newport, R. I., to 29 W. 36th St., New York City.
Lundgren, C. E., from 58 Norman to 571 Leonard, Brooklyn, N. Y.
Middleton, T. S., from 468 La Salle Av. to 18 Maple, Chicago.
Miller, J. W., from 2 Central Av. to Armour Sta., Kansas City, Kas.
Nossman, A. J., From Leighton to Pella, Iowa.
Rugg, D. F., from Hartland, Vt., to 110 S. Edith St., Albuquerque, N. M.
Smith, W. O., from Toledo, Ohio, to Lock Box 635, Philadelphia, Pa.
Stephenson, H. E., from 1021 Van Buren St. to 1127 W. North Av., Chicago.
Stevens, A. M., from Fort Wayne, Ind., to Box 17 Maysville, Mich.
Walker, W. E., from Bay St. Louis, to Waveland, Miss.
Whalen, C. J., from 235 to 225 Dearborn Av., Chicago.
Wray, W. S., from 1234 N. 7th to 26 S. 18th, Philadelphia, Pa.

LETTERS RECEIVED.

American Therapeutic Co. (2), New York City; Ashmead, A. S., New York City; Atkinson, W. B., Philadelphia, Pa.

Baldwin, J. F., Columbus, Ohio; Bartlett, C. L., Chicago; Barto, F. C., Plainville, Ill.; Battle Creek Sanitarium, Battle Creek, Mich.; Bean, W. W., Rolfe, Iowa; Bell, J. M., St. Joseph, Mo.; Bibbens, S. S., Syracuse, N. Y.; Bischoff, C. & Co., New York City; Bogie, M. A. Kansas City, Mo.; Bowen-Merrill Co., The, Indianapolis, Ind.; Braetelien, S., Minneapolis, Minn.; Brown, H. L., Washington, D. C.; Burr, C. B., Flint, Mich.

Campbell, J. Y., Paxton, Ill.; Campbell, L. S., Los Angeles, Cal.; Campbell, W. A., Muskegon, Mich.; Cartwright, F. D., Nashville, Tenn.; Cavanaugh, J. J., Ft. Scott, Kas.; Cheney, J. V., Chicago; Chilgren, G. A., Yankton, S. D.; Codman & Shurtleff (2), Boston, Mass.; Colorado Sanitarium, Boulder, Col.; Cook, G. F. (2), Milford, Conn.; Cowell, C. W., Knoxville, Iowa; Courtright, C. W., Chicago; Cox, J. Emit, Carson City, Nev.; Crawford, S. K., Chicago; Crowell, H. C., Kansas City, Mo., Culbertson, L. R., Zanesville, Ohio; Curry, J. E., Sullivan, Ky.

Dennis, F. W., Unionville, N. Y.; Dunn, B. B., Perry, Ill.; Dunn, E. A., Washington, D. C.; Dunning, L. H., Indianapolis, Ind.

Electric Light Bath Co., Battle Creek, Mich.; Elkin, T. F., Nettleton, Miss.; Elliott, A. R., New York City; Elliott, H. G., New York City.; Evans, T. C., Louisville, Ky.

Farbenfabrinken of Elberfeld Co., New York City; Flack, A. C., Fredonia, Kas.; Fort, I. A., North Platte, Neb.; Foster, J., Job P. O., Pa.; Fowler, F. M., Elizabethtown, Ill.; Fowler & Collwell, Los Angeles, Cal.; Fuller's Adv. Agency, Chas. H., Chicago.

Gardner, G. E., Doylestown, Ohio; Gerrish, F. H., Portland, Me.; Gilbert, C. S., Chicago; Gilmore, J. H., Pittsburg, Pa.; Gleason, H. E., Fredonia, N. Y.; Goodrich, E. S., Chicago; Gorham, F. P., Providence, R. I.; Gould, G. M., Philadelphia, Pa.; Graham, A. R., Cincinnati, O.; Grant, J. A., Washington, D. C.; Greene, C. S., Detroit, Mich.; Gregg, J. R., Richmond, Ind.; Gunckel, C. F., Indianapolis, Ind.

Hague, A. S., Grand Ridge, Ill.; Hansen, L. A., Nashville, Tenn.; Hare, H. A., Philadelphia, Pa.; Hektoen, L. (2), Chicago; Hertzler, A. E., Halstead, Kas.; Highsmith, Geo. R., Carrollton, Mo.; Hill, E. E., Chicago; Hoffman Battle Creek Sanitopolis, Ill.; Holland, A. B., Wellsville, Ohio; Holland, J. W., Philadelphia, Pa.; Hovey, J. A., New York City; Hummel Adv. Agency, A. L. (3), New York City; Huston Bros., Chicago.

Jewell, P. M., Ossian, Iowa; Journal of Cut. and Genito-Urinary Diseases, New York.

Keene, Geo. F., Howard, R. I.; Kell, J. B., Limaville, Ohio; Kenyon News and Postal Subscription Co., Chicago; Kidd, J. W., Joliet, Ill.; Kober, Geo. N., Washington, D. C.; Koechl & Co., Victor, New York City.

Lehman, S. S., Chicago; Leith, A. R., Wilton, Iowa; Lord & Thomas, Chicago; Lutz, L., Kansas City, Kas.

Maltine Company, The, New York City; Martin, Ira M., Raymond, Wis.; Mattison, J. B., Brooklyn, N. Y.; Meyers, S. N., Martinsburg, W. Va.; Miller, J., Bondurant, Iowa; Milliken & Co., J. T., St. Louis, Mo.; Minor, J., New Hartford, N. Y.; Moeller, T., Hinn, B. D., Moore's Newspaper Subscription Agency, Brockport, N. Y.; Murdock, F. H., Pittsburg, Pa.; McDill, J. R., Savannah, Ga.; McDougall, C. S., Athens, Ohio; McGahen, C. T., Aiken, S. C.; McKesson & Robbins, New York City.

Noble, R. (2), Toledo, Ohio; Nichell, H., Buffalo, N. Y.; Norwich Pharmacal Co., Norwich, N. Y.; Nutrolactus Co., The, New York City.

Opitz, R. B., Breslau, Germany.

Pantagraph Ptg. and Sta. Co., Bloomington, Ill.; Parke, Davis & Co., Detroit, Mich.; Pasteur Vaccine Co., Chicago, Pollak, S., St. Louis, Mo.; Pond, J. C. (2), Milwaukee, Wis.

Reed & Carnrick, New York City; Rettich, J., Louisville, Ky.; Robins, A. H., Richmond, Va.; Robinson, J. A., Globe, S. C.; Rosse, I. C., London, England.

Sanitarium, The, Battle Creek, Mich.; Saunders, W. B., Philadelphia, Pa.; Scales, J. L., Alden Ridge, La.; Schering & Glatz, New York City; Scott & Bowne, New York City; Seibert, W. H., Steelton, Pa.; Sherer, J. W., Kansas City, Mo.; Shoemaker, E., Newfane, N. Y.; Shields, W. J., New Wilmington, Pa.; Smart, Chas., Washington, D. C.; Smith, A. M., Tacoma, Wash.; Smith, Q. C., Austin, Texas; Snydacker, E. F., Chicago; Somers, A. B., Omaha, Neb.; Spalding, W. C., New York City; Stoner, C. E. Des Moines, Iowa; Stubbert, J. Edw., Liberty, N. Y.; Subscription News Co., Chicago.

Taylor, T. L., New Castle, Neb.; Teeple, M. L., Grove, Mich.; Thomson, Wm., Philadelphia, Pa.; Torrey, Edw., Allegany, N. Y.; Tyson, Jas., Philadelphia, Pa.

Van Houten & Ten Broeck, New York City; Van Slyke, W. H., Hancock, Mich.; Vinnedge, W. W., La Fayette, Ind.

Walker, H. T., Dubuque, Iowa; Watson & Sons, W., London, England; Webster, David, Grand Ridge, Ill.; White, A. E., Scranton, Pa.; White Rock Mineral Spring Co., Waukesha, Wis.; Whitney, H. M., Boston, Mass.; Widmer, W. A., Philadelphia, Pa.; Wikoff, A. A., Decatur, Ohio; Woldert, E. A., Philadelphia, Pa.; Woodruff, E. W., Columbus, Ohio.

Zellen, J. O., L'Anse, Mich.